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BY SIR WILLIAM WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P. LOND.,
PHYSICIAN TO ST. MARY'S HOSPITAL.

LECTURE III.

THERE is no variety of toxic jaundice produced by known chemical exogenous poisons for which an exact counterpart may not occur from biological toxins, and the converse is also true. The morbid anatomical and histological changes in the liver may be precisely the same under the two conditions. The bacterial infection may be that of a micro-organism the characters of which are generally accepted as specific or from one of a group of organisms, such as the streptococcal group, the specificity of which is indefinite.

Enteric Group Disease.

Typhoid Fever.—Jaundice is well recognised as a complication of this disease. Osler[35] quotes from his series of 1500 cases the occurrence of jaundice as 0·5 per cent. and that of cholecystitis as 1·3 per cent. In the epidemics of typhoid fever which occurred in the East during the late war jaundice was certainly more frequent than this. Usually the jaundice occurred during the height of the fever, and resembled in its course that of epidemic catarrhal jaundice superadded to the typhoid fever attack; its presence did not seem to add seriously to the gravity of the prognosis unless it was associated with acute cholecystitis.

The cause of the jaundice appears often to be an ascending infection, causing catarrhal inflammation of the intrahepatic bile-ducts, though no doubt the liver cells may be acted upon directly by the toxins in the circulation and jaundice arise thereby.

A case of typhoid under my care in March, 1931, is of interest.

CASE 27.—Mr. X, onset Feb. 5th, 1931. Temperature 103° F. *B. typhosus* was found in the blood on Feb. 7th and 11th. The case ran the usual course of an acute typhoid attack. On Feb. 18th an acute attack of abdominal pain occurred, associated with sudden collapse and drop of temperature to 97°; the clinical symptoms resembled those of intestinal perforation. On examination of the abdomen no signs of peritonitis were found, but the gall-bladder could be felt projecting forwards like a distended sausage skin. Sir Crisp English saw this case with me and confirmed the diagnosis. Hypodermic administration of atropine and local fomentations were followed by a rapid disappearance of the symptoms, of which there has been no recurrence.

Paratyphoid Fevers A and B.—These diseases were extremely common during the Dardanelles and Mesopotamian campaigns. Jaundice was comparatively frequent, probably occurring in more than 5 per cent. In fact, so frequent was it that some observers suggested that epidemic catarrhal jaundice was due to paratyphoid infection, but this assumption was not borne out by the bacteriological investigations. Jaundice occurred in both paratyphoid A and B cases.

In enteric and paratyphoid fever the commonest time of onset is towards the end of the second week. I have, however, seen cases, the diagnosis of which was confirmed by positive blood culture, in which jaundice occurred within the first six days, and in a few it was present at the onset of the symptoms. In one case it did not occur until the twenty-ninth day of the disease.

CASE 28.—One case seen by me in 1915 in the Dardanelles was under the care of Captain C. H. Corbett, R.A.M.C. The patient developed jaundice on the third day after admission to hospital, and death occurred six days later from sudden collapse. At the post-mortem examination the mucous membrane of the duodenum was found to have a red velvet appearance, and the walls of the common bile-duct and hepatic ducts showed acute inflammation; the gall-bladder was distended with semi-purulent greenish bile which contained paratyphoid B organisms.

I have seen toxic jaundice in more than one case during the severe febrile reaction lasting several days which followed a full dose of prophylactic typhoid vaccine. This shows that a blood-borne toxic jaundice may follow typhoid infections, quite apart from an ascending inflammation by the bile-ducts.

Parenteric Infections.—A group of non-lactose fermenting coliform bacilli very closely resembling the typhoid bacillus but differing from it in certain sugar-fermenting reactions and in serum agglutination tests is included in this group. Examples are: *B. asiaticus* and *pseudo asiaticus*, *B. fæcalis alkaligenes* and *pseudo-fæcalis alkaligenes*, the bacillus of epidemic jaundice, and Morgan's bacillus. These organisms may give rise to an acute illness closely resembling typhoid fever clinically, the organisms being found in the blood, the stools, and urine. In 1917 in Mesopotamia an outbreak of illness presenting the clinical symptoms of typhoid occurred in five members of a mess. Those cases which were seen by me, were fully investigated bacteriologically by Lieut.-Colonel F. P. Mackie, I.M.S., and the organism found responsible for them was *B. fæcalis alkaligenes*. Similar outbreaks due to *B. asiaticus* have occurred in Egypt. I have met with many cases of illness of a typhoid-like character where the bacteriological findings have confirmed the presence of one or other of this group of organisms as the causal agent.

The illness "parenteric fever" usually runs a much shorter course than typhoid and is not associated with the symptoms of intestinal ulceration though the characteristic spots and enlargement of the spleen are commonly observed and jaundice may occur.

This group of organisms is often associated with abdominal symptoms of a chronic or subacute type, such as jaundice, cholecystitis, enteritis, colitis, and hepatitis. Attention was called to parenteric infections in a paper published by me in June, 1927.[36] Numerous cases of chronic toxic jaundice have been under my care where the bacteriological examination of the stools has shown the presence of one of this group of organisms and where a definite serum agglutination reaction of high value has been given.

CASE 29.—A medical man under my care at St. Mary's Hospital in 1928 had been for a holiday in France and returned with jaundice of a mild toxic type. *B. asiaticus* was found in the stools and a serum agglutination reaction of 1 in 250 was given to the organism found.

I am fully aware that organisms of the parenteric group are very commonly found in the stools of persons who have been abroad, especially in tropical countries, and that these organisms may exist apart from any symptoms of illness; in other words, "carriers" are comparatively common. The conclusion that a member of this group is responsible for jaundice in a given case must not be arrived at

* The Lumleian Lectures delivered before the Royal College of Physicians of London on March 19th, 24th, and 26th, 1931. Lectures I. and II. appeared in THE LANCET of July 4th and 11th respectively.

hastily. These infections may cause an alteration in the agglutination reaction to typhoid or paratyphoid A and B, and so may lead to the incorrect assumption that enteric group disease is present. I have come to the conclusion that agglutination reactions alone are of little or no value in making a diagnosis of enteric group disease; they must be confirmed by other findings, such as blood culture, the presence of the organisms in the excreta, and leucopenia.

In some cases of chronic toxic jaundice of intestinal origin *B. coli communis* may play a causative part.

CASE 30.—A man, aged 46, was seen on Sept. 19th, 1930. He gave a history of liver attacks every few months for 20 years, often associated with mild jaundice for some days, and discomfort in the right hypochondrium, but no actual pain. The liver was enlarged and smooth, reaching 2 inches below the subcostal border in the right nipple line. There was no history of alcoholism or syphilis, and the Wassermann reaction was negative. Radiography of the gall-bladder after tetraiodophenolphthalein showed nothing abnormal. Bacteriological examination of the stools by Dr. A. Fleming showed hæmolytic and non-hæmolytic *B. coli*, the latter giving a positive agglutination reaction with the serum of 1 in 120. The toxic jaundice was apparently due to this infection.

In this case the administration of alkalis, liver extract, and glucose, and inoculations with an autogenous *B. coli* vaccine, have been followed by a complete disappearance of the symptoms and signs.

Food-poisoning Organisms.—These are closely allied, morphologically and culturally, with the parenteric group of organisms. Clinically they are entirely different, for they give rise to acute enteritis, the latent period of the symptoms being very short: a few hours up to three or four days. The organisms are known as the "salmonella group," and the two chief are *B. aertrycke*, of which there are many strains, and *B. enteritidis* (Gaertner's bacillus), of which many strains have been described. Occasionally the dysentery bacilli, such as the bacillus of Shiga or of Flexner, may give rise to acute food poisoning.[37] Food-poisoning infections are not infrequently associated with toxic jaundice, a typical case of which is the following.

CASE 31.—A man, aged 40, was seen by me in consultation with Dr. A. H. Thomas on July 26th, 1928. He had enjoyed fairly good health, and had been accustomed to take alcohol fairly freely but not to excess. Two teeth has been removed on July 17th, after which somewhat unusual bleeding had occurred, but not sufficient to require medical attention. On July 19th he had eaten a ham sandwich at a restaurant. He had thought this was not good, and shortly afterwards had experienced nausea and abdominal discomfort. On July 20th he had consulted Dr. Thomas, and his temperature had been 99° F. On July 23rd a macular rash had appeared on his chest. On July 25th he had slight jaundice and a temperature of 100°. Diarrhœa and pyrexia continued. On July 26th he was drowsy, delirious, and incontinent of fæces and urine, and showed ptosis of the eyelids. This patient was also seen by Dr. Geoffrey Evans and the clinical diagnosis of food poisoning was made. Bacteriological examination of the stools showed an infection with one of the salmonella group. The patient died on July 27th from symptoms of hypohepatism and toxæmia.

The case was reported to the coroner. Post-mortem examination by Dr. Newcomb showed acute gastro-enteritis. The liver was large, pale, and flabby, and showed marked fatty degeneration. Cloudy swelling of the kidneys and suprarenals was present. Cultures from the spleen showed a marked infection with one of the salmonella group of organisms.

In this case the cause of death was acute food poisoning; possibly the toxæmia associated with the dental extractions and the history of moderate excess of alcohol were contributing factors. A point of interest in the case was that at the time of the illness numerous cases of food poisoning from infected ham had occurred in London, several of them in the police force.

Influenza.—The occurrence of jaundice in influenza, especially in the gastro-intestinal type, has been long recognised. Epidemics vary greatly as regards the occurrence of jaundice; in some it may be relatively common, but usually it is absent or very rare. Sir Wilmot Herringham in 1919[38] pointed out that in the epidemic of influenza in March, 1919, jaundice became for the first time a fairly frequent symptom.

Pneumonia.—Jaundice, like influenza, occurs with irregularity in outbreaks of pneumonia; usually it is rare, but in some outbreaks it may be not uncommon. It is usually of toxic type and due to the action of the pneumonia toxins in the liver cells.[39]

Streptococcal Infections.—Toxic jaundice has been observed on many occasions during the acute streptococcal infection associated with tonsillitis or sinus inflammation in the nasopharynx, and in cases of dental infection.[40] In acute streptococcal septicæmia toxic jaundice sometimes occurs, owing to the action of the circulating toxins on the liver cells. The jaundice of streptococcal infections is sometimes of the hæmolytic type, and then an indirect van den Bergh reaction is given. The following two cases are illustrative.

CASE 32.—A man, aged 57, gave a history of recurring gout for years. "Influenzal attacks" often occurred two or three times a year. He had been treated for flatulence and dyspepsia from time to time for the last year. From May 20th to May 22nd, 1927, he had malaise and fatigue. On May 23rd his temperature was 100° and he had jaundice. On May 27th he developed pneumonia in the middle and lower lobes of the right lung, and the jaundice was more marked. Bacteriological examinations by Dr. John Freeman showed a streptococcal infection in the sputum and stools. The Wassermann reaction was negative. On June 2nd the van den Bergh test showed a very marked biphasic reaction. The icterus index was 150 and the blood-urea 134 mg. per 100 c.cm. The urine had a specific gravity of 1020 and a urea content of 2 per cent. It showed a cloud of albumin and large numbers of granular and epithelial casts. Bile-pigments and bile-salts were present. The stools were clay-coloured.

This patient was also seen by Sir Humphry Rolleston and Sir John Rose Bradford, who confirmed the diagnosis of toxic jaundice. On June 5th there were some delirium and muscular twitchings, and the symptoms of acute hypohepatism (icterus gravis) gradually developed in spite of all treatment. Death occurred on June 11th.

In this case the symptoms of toxic jaundice due to necrosis of the liver were combined with those of uræmia due to the poisoned kidneys.

CASE 33.—A married woman, aged 52, with three children, was under the care of Dr. Hugh C. Wilson. In December, 1920, a gastro-jejunostomy was performed for a dilated duodenum, but no ulcer was found. In August, 1921, laparotomy was performed for adhesions. At a subsequent laparotomy in December the gastro-jejunostomy opening was closed and an anastomosis was made between the duodenum and jejunum. In July, 1922, anæmia developed. In September, 1923, the remaining teeth were removed. The patient was first seen by me on Jan. 22nd, 1924. She was suffering from recurring attacks of abdominal discomfort associated with colon spasm and the passage of much mucus. These attacks were accompanied by mild jaundice with hepatic discomfort and an increase in the anæmia. On Feb. 1st, 1924, bacteriological examinations by Dr. A. Fleming showed a marked intestinal infection with *Streptococcus viridans*. The blood picture was typical of pernicious anæmia. A blood transfusion was given on Feb. 2nd. In view of the recurring attacks of abdominal pain the abdomen was opened on Sept. 11th; numerous adhesions were found and a dilated gall-bladder, with one very small stone which was playing no part in the causation of the symptoms. The patient died two days after the operation, internal hæmorrhage resulting, as so often happens after operation in cases of toxic jaundice.

In this case the recurring attacks of toxic jaundice and hepatitis appeared to be due to the streptococcal bowel infection.

Staphylococcal infections, if of an acute or subacute type, have been associated with toxic jaundice.

Epidemic Catarrhal Jaundice.

This disease occurred with great frequency during the late war. It was most common in those areas where intestinal disease was most rife, for example in the Dardanelles and Mesopotamia. It was generally of a mild type and clinically similar to the cases of ordinary catarrhal jaundice met with in this country; in fact, the diseases are, in my opinion, identical. Gunson and Gunn published [41] an interesting account of a series of cases occurring in British troops at Alexandria in 1915, and I published an account of the epidemic jaundice in the Dardanelles.[42 49] In 1916 Archibald, Hadfield, Logan and Campbell [43] described their careful work in the Mudros laboratories on the Dardanelles cases, while Martin [44] published an account of the pathology and ætiology of the disease.

An interesting account of a recent epidemic in Yorkshire was published by Pickles.[45] A Ministry of Health report on an outbreak of 200 cases was published in 1927 [46]; in this epidemic there was one death.

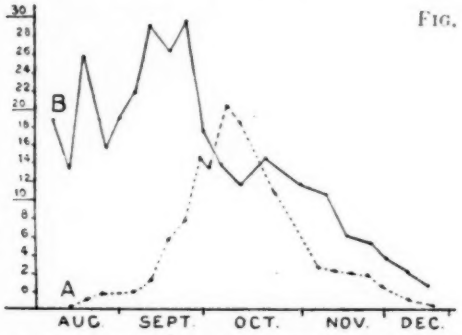


FIG. 4.

Incidence rate of epidemic jaundice and diarrhœal diseases in the Dardanelles per 1000 troops in one Division from August 7th to Dec. 19th, 1915. A = jaundice. B = diarrhœal diseases (diarrhœa, enteritis, and dysentery).

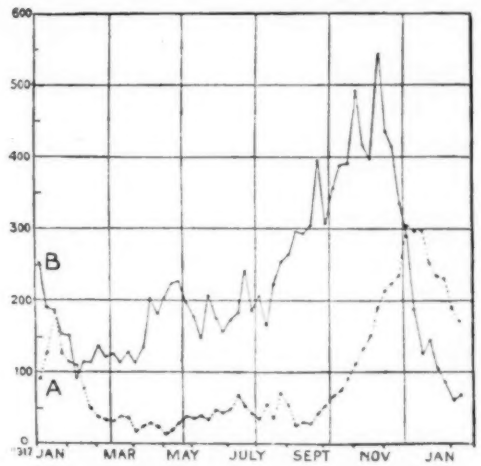
Epidemic catarrhal jaundice is not a new disease. In the American War 22,509 cases occurred, with a mortality of 161, or 0·71 per cent.; in the South African War 5648 cases occurred with a small mortality.

Ætiology.—Bacteriological investigations have, up to the present, failed to identify any specific organism. In some cases coliform organisms of the *B. coli communis* or *B. fæcalis alkaligenes* type have been found. It seems probable that the disease is caused by a catarrhal condition of the duodenum and bile-ducts set up by organisms which are found in health in the intestinal tract. In this way the disease resembles the common "cold in the head," which may be set up by many different catarrhal organisms which are commonly present in the nasal passages in conditions of health.

The disease, like typhoid, does not appear to be contagious from person to person, though many people may become infected from a common cause. The war experience indicates that the alimentary tract is the channel of infection. This is well illustrated by a comparison of the curves (Fig. 4) for epidemic jaundice and diarrhœal diseases in the Dardanelles and Mesopotamia. Pickles suggested that the infection might be air-borne, but this view does not agree with war experience. The disease often occurs in epidemics, but sporadic cases of an identical disease are commonly met with in ordinary medical practice.

Mortality.—In 1917 the Mesopotamian records showed that in British troops the mortality from 1538 cases was 0·6 per cent., while in Indian troops the mortality out of 2633 cases was 0·3 per cent., the gross mortality being 0·41 per cent.

Symptoms.—Usually there is a premonitory period of a few days, associated with nausea and perhaps some occasional vomiting, abdominal discomfort, and diarrhœa; or constipation may be present. The temperature is normal during this period. Pyrexia, usually of a mild type, now sets in, accompanied by chilliness and occasionally shivering; the tongue is moist and often furred. Nausea and vomiting sometimes occur at the onset of the pyrexia, also headache and general pains may be present. Acute abdominal pain is absent, but there is usually some discomfort in the hepatic and epigastric regions. The pyrexial period usually lasts for from two to four days.



Incidence rate of epidemic jaundice and dysentery in Mesopotamia for 1917–18. A = jaundice. B = dysentery.

Jaundice generally appears about the third or fourth day from the onset of the pyrexia. It gradually deepens and becomes of the ordinary obstructive type, with putty-coloured stools and bile-containing urine. It attains its maximum in about ten days and then gradually subsides. It is important to realise that the pyrexial period may sometimes be prolonged (Fig. 5); I have seen it last for 14 days. Also the jaundice may persist for several weeks, even as long as ten weeks, ultimately clearing up. Unless this is realised there is risk of an unnecessary surgical operation on these cases on the assumption that there is obstruction of the common bile-duct. As already pointed out, a surgical operation on a case of toxic jaundice is associated with danger, and fatal hæmorrhage not infrequently results.

In catarrhal jaundice the liver shows a considerable uniform enlargement and is slightly tender up to the time that the jaundice begins to subside and the stools resume their normal colour. It then gradually returns to its normal size. As a rule the gall-bladder cannot be felt, though in a small proportion of cases—about 10 per cent.—it appears to be enlarged. The spleen is enlarged in the early stages of the illness and can be felt extending below the left subcostal

border for half an inch or more for a few days from the onset of the pyrexial period. The enlargement quickly subsides.

A curious and constant feature of catarrhal jaundice is the definite increase in the deep cardiac dullness in the fourth intercostal space to the right of the sternum. This dullness may extend for an inch or more to the right of the sternal border, and corresponds to a dilatation of the right auricle. There is usually no sign of dyspnœa or cardiac distress, and it seems likely that the increased dullness may be due to a tilting upwards of the heart by the enlarged liver and spleen. X ray examinations should clear up this point.

Usually cases of catarrhal jaundice give rise to no anxiety, but a cautious prognosis should be given, since it is known that fatal symptoms of hypohepatism due to necrosis of the liver occur in from ½ to 1 per cent. of cases. Catarrhal jaundice demands careful treatment and should not be lightly regarded. Rest in bed till the jaundice subsides and a careful diet régime are indicated. Lack of care in treatment increases the risk of necrosis of the liver cells or of the development of a chronic progressive hepatitis.

HYPOHEPATISM AND NECROSIS OF THE LIVER IN CATARRHAL JAUNDICE.

The symptoms of this grave condition have already been described. They usually begin about ten days after the appearance of the jaundice, but in one case they occurred on the second day, in another the fourth day, and in a third the twenty-fifth day afterwards. There appears to be no relation between the depth of the jaundice and the frequency of occurrence of this grave complication. Some cases were not deeply jaundiced at the time of the onset of the symptoms of hepatic failure; also the preliminary symptoms of the illness were exactly like those of the ordinary type of the disease and gave no warning of the future grave development.

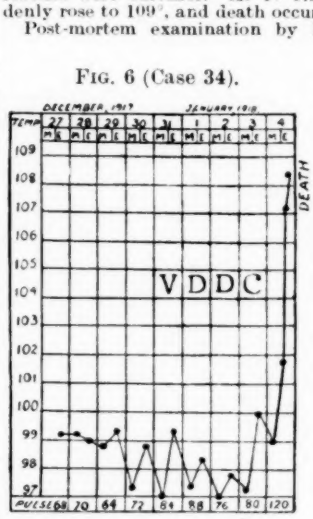
One case out of a considerable number of which I have notes might be quoted (Fig. 6).

CASE 34.—Lieut. A. was taken ill on Dec. 24th, 1917, with slight fever and the usual symptoms of epidemic catarrhal jaundice On Dec. 28th his temperature was normal, his liver enlarged and tender, his spleen palpable and slightly tender, and his tongue furred; definite jaundice was now present. The bowels were constipated and the urine bile-stained. The mental condition was normal.

Several attacks of vomiting occurred from Dec. 29th to Jan. 1st, 1918. On Jan. 2nd the vomit contained streaks of blood and was bile-stained. The jaundice was now deep. Restlessness and delirium began during the early morning and throughout the day. On Jan. 3rd he vomited blood-stained material and had epistaxis. The liver dullness was now much diminished, being only two inches vertically in the right anterior axillary line. The patient was very restless and noisy, and his knee-jerks were increased. On Jan. 4th he became comatose in the morning. The urine contained albumin and bile and a few red corpuscles. No spirochætes were present in urine or blood. At 5 P.M. Cheyne-Stokes' respiration appeared, and the plantar reflexes were extensor. At 10 P.M. the temperature suddenly rose to 109°, and death occurred at 10.30 P.M.

Post-mortem examination by Lieut.-Colonel J. C. G. Ledingham, R.A.M.C., and Major T. Y. Gloster, I.M.S., showed: liver 39½ oz. and stained yellow. Spleen enlarged and soft, kidneys yellowish, small hæmorrhages in the pleura, pericardium, omentum, mesentery, and lungs. The mucous membranes of stomach and duodenum contained petechiæ and the contents were blood-stained.

FIG. 6 (Case 34).



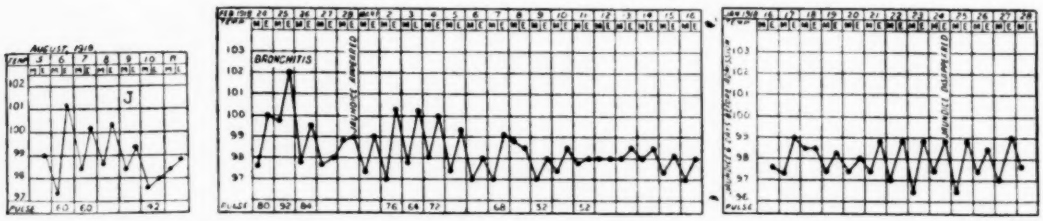
Epidemic catarrhal jaundice with icterus gravis. Jaundice before admission. V = vomited. D = delirious. C = coma. Post-mortem, "Acute yellow atrophy."

Microscopical examination showed that there was almost complete destruction of the hepatic cells in blocks; only isolated islets of cells remained. In parts there was total necrosis of all but the trabecular tissue. The kidneys showed extensive degeneration of the tubular cells, and the pancreas early but definite cell necrosis, with shrinkage and loss of outline of the cells that remained; in some places there was a great reduction in the number of cells.

Microscopical examination and animal experiments were specially made for the detection of spirochætes, but were entirely negative.

The conclusion arrived at from a study of the clinical symptoms of the disease and from the post-mortem results of a considerable number of fatal cases was that in the majority of cases there was an ascending catarrh of the bile-ducts, leading to a temporary obstruction which was usually intrahepatic. In the more serious cases there was, in addition, a marked degeneration of the hepatic cells which in the fatal cases went on to complete necrosis.

FIG. 5.



Three cases of epidemic catarrhal jaundice. In the first chart J = time of appearance of jaundice. In the third chart jaundice appeared six days before admission.

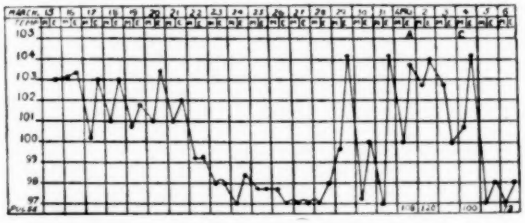
Protozoal Poisons.

Syphilis.—The occurrence of jaundice in this disease is so well known as to need only brief mention. In the acute secondary stage jaundice may be due to the general syphilitic hepatitis accompanied by catarrh of the smaller bile-ducts. In congenital and tertiary syphilis the hepatic fibrosis, whether unilobular, multilobular, or in gross patches forming gummata or scars, is often associated with jaundice.

Relapsing Fever (Figs. 7 and 8).—This disease, due to a blood infection with the spirochæte of Obermeier,

is often associated with jaundice.[49] The jaundice occurs quite early, often on the second or third day, and is usually well marked. Captain M. A. Nicholson, I.M.S., from a careful examination of 241 cases in the Isolation Hospital in Bagdad in 1917, found jaundice present in 64 per cent. of cases. The pathology of the condition is analogous to that

FIG. 7.



Relapsing fever (Indian), six days' apyrexia. A = blood positive to spirochætes. C = salvarsan 0·3.

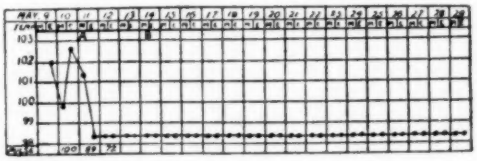
of the jaundice in secondary syphilis, and the general hepatitis set up by the spirochætes appears to be responsible. Hepatic necrosis rarely occurs.

Yellow Fever.—In this disease marked cellular necrosis occurs in the liver, often in association with jaundice. The depth of the jaundice is no criterion of the severity of the disease, for it may be slight in the fatal and intense in the less severe cases. Hypohepatism plays an important part in the causation of the grave symptoms. The van den Bergh reaction in cases with marked jaundice was shown by Aitken and Smith[47] to give positive direct results.

Spirochætosis Ictero-hæmorrhagica.—This disease is regarded by Rolleston and McNee as identical with the disease formerly known as Weil's disease. The symptomatology and pathology are quite distinct from that of epidemic catarrhal jaundice, with which there was some confusion during the war. In a report by the Medical Research Council on spirochætal jaundice (No. 113) reference is made to outbreaks which have occurred in Scotland and England. Jaundice, as pointed out by Stokes, Ryle, and Tytler,[48] is not a constant feature of the disease, being present only in 74 per cent. of cases. The van den Bergh reaction is biphasic. The liver does not show the extreme degree of hepatic necrosis found in severe toxic jaundice. When necrosis occurs the destruction of hepatic cells does not appear to be in bulk but is patchy. Fatty degeneration of the liver cells is not a marked feature.

Malaria (Figs. 9 and 10).—The marked action of the malarial parasite on the red blood corpuscles leads to hepatic and splenic enlargement and anæmia. The hepatitis resulting from a malarial infection is often associated with jaundice, and this is especially so when the infection is of the malignant type. The part played by anoxæmia of the liver cells in the development of jaundice has been already mentioned. For this reason jaundice is much more likely to occur in a patient suffering from a malarial infection when marked anæmia is also present. The liver cells do not suffer the extreme damage and necrosis so commonly seen in toxic jaundice, and as a consequence the development of symptoms of acute hypohepatism is uncommon.

An interesting epidemic of jaundice associated with malaria was investigated by me in September, 1918. At that time a large percentage of the British troops in Northern Persia were infected with malaria and the infection had remained dormant until the influenza epidemic had spread to this region. Towards the end of September many men were attacked by influenza, and this infection stimulated the latent malarial infection into activity, so that the short

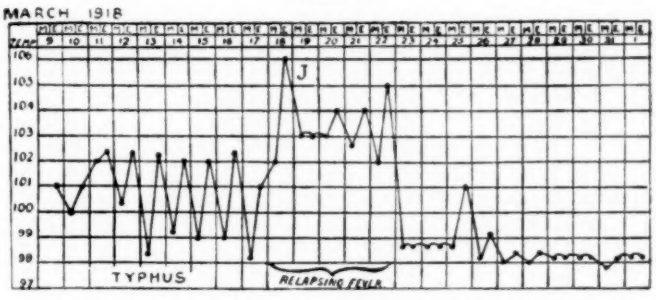


Relapsing fever (Arab). A = blood positive to spirochætes. B = salvarsan 0·3 g.

pyrexial period of the influenzal attack was succeeded or accompanied by the high fever and characteristic symptoms of acute malaria. The liver and spleen were considerably enlarged in a high percentage of these cases, and marked jaundice was a very common symptom. Major C. Christie, R.A.M.C., examined the blood in a large number of these cases and confirmed the diagnosis. He found that in 40 per cent. of the cases of malaria and influenza the parasites were of the malignant tertian type. The combination of the malarial toxins with those of influenza was no doubt the cause of the intense toxic action on the liver and of the resulting unusually high incidence of jaundice.

Blackwater Fever.—A type of malaria associated with intense destruction of the red blood corpuscles and hæmoglobinuria is commonly associated with early jaundice of toxic type. The anoxæmia caused by the severe anæmia is an important added ætiological factor.

FIG. 8.



Typhus fever and relapsing fever (Arab). J = jaundice.

Amœbic Dysentery.—The hepatitis so well known to be associated with this infection is frequently associated with jaundice of intrahepatic type.

Typhus Fever.—Jaundice is a rare complication of this disease and was only seen by me in two out of several hundred cases in Mesopotamia.

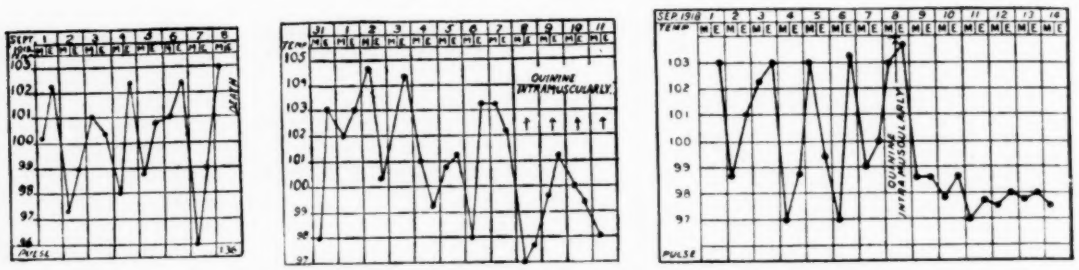
Kala-azar.—This disease, due to the blood infection with leishmanial parasites, is associated with anæmia, enlargement of the liver and spleen, and prolonged pyrexia. Jaundice as a result of the hepatitis and blood destruction is a fairly common symptom.

Auto-intoxication.

The Toxæmias of Pregnancy.—These little-understood conditions are manifestations of grave toxæmias of autogenous origin. Intense fatty degeneration and necrosis of the liver is not uncommon, and symptoms of acute hypohepatism, often associated with jaundice, are not infrequent complications.

Recurrent Vomiting (Acidosis) in Children.—This condition has been commonly attributed to acidosis and associated ketonæmia. When it is fatal, post-mortem examination usually reveals a large yellow liver showing intense fatty degeneration and necrosis of the hepatic cells. I am firmly of opinion that in these cases the fatty degeneration of the liver is not the result of the acidosis at all. The true explanation is to be found in the presence of some underlying toxic cause, such as infected tonsils or adenoids, intestinal toxæmia or grave errors in diet, whereby the liver degeneration is set up. The resulting impairment of liver function gives rise to prolonged vomiting and consequent lack of nutrition, which is quite an adequate explanation of the acidosis and ketonuria

FIG. 9.



Three cases of malignant malaria with jaundice. The first was fatal.

salvarsan. On Jan. 1st, 1928, he was given 0·3 g. and on Jan. 14th and 28th, Feb. 11th and March 9th, 0·6 g. On Feb. 15th 12 teeth were removed under chloroform anæsthesia, the operation lasting nearly two hours. On March 9th, in the evening after the last injection of salvarsan, the temperature rose to 105° and some vomiting occurred. On March 10th he went to business, fainted three times, was sick once, and had his bowels opened four times. On March 11th he was sick three times and jaundice developed. On March 12th the jaundice was deeper and the temperature was 99·5°. The urine contained a trace of albumin and a trace of acetone. Herpes developed on the right upper lip. On March 13th he was sick twice and had bleeding from the nose and gums. On March 15th stupor, delirium, twitchings, and coma developed, and signs of consolidation of the left lower lobe was marked. He died on March 17th, 1928.

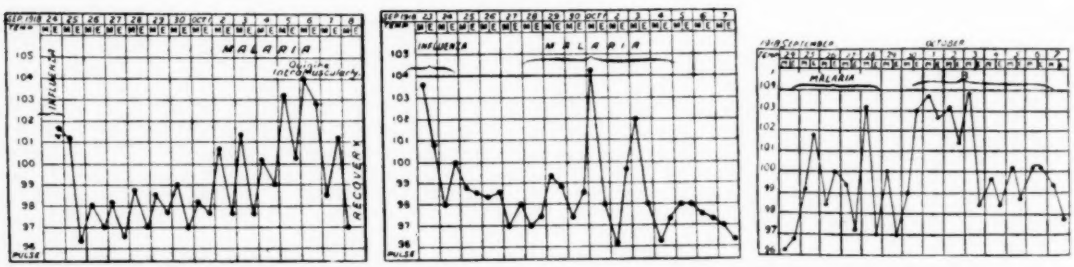
Post-mortem examination showed degenerative changes in the liver cells and a terminal pneumonia of the left lower lobe of the lung.

The ætiological factors in the causation of the toxic jaundice were the salvarsan injections, the streptococcal toxæmia from the dental extractions and the chloroform given as the anæsthetic.

The Control of Poisons.

The consideration of the great variety of drugs in common use which may act as liver poisons and produce dangerous toxic jaundice shows how neces-

FIG. 10.



Three cases of malaria and influenza. In the third chart B = consolidation at right apex (tuberculous).

Acholuric Jaundice.—This condition is no doubt due to some auto-intoxication, probably one of the inborn errors of metabolism so admirably described by Sir Archibald Garrod. The jaundice in this condition is the perfect example of hæmolytic jaundice, and the van den Bergh reaction is typically indirect. Anoxæmia plays a part in its causation; in other words, the greater the anæmia the more marked will be the jaundice.

A review of the above types of toxic jaundice shows how varied may be their causes. Frequently in clinical practice a combination of the causes exists, as, for example:—

CASE 35.—A man, aged 45, gave a history of syphilis, and the Wassermann reaction was plus. Between April 4th, 1920, and June, 1922, he received 12 injections of 0·6 g.

sary it is that these drugs should be submitted to careful toxicological and therapeutic tests on the human subjects as well as on animals before they are placed on the market. The medical profession should be fully informed, not only of the therapeutic properties for good of new drugs, but also of the dangers which may arise from idiosyncrasy or overdosage. It cannot be said that this is the case at the present time. The existing system of scheduling of poisons is quite inadequate to keep pace with the rapid developments of the chemical manufacturing industries, which are daily launching new and imperfectly tried complex organic drugs on the market in this country.

As already pointed out, the quinophan group is not even on the Poisons Schedule, and can be sold

by any unqualified person and purchased at will by the public without any medical intervention or advice. The system of the control and sale of drugs possessing powerful toxic properties is at present most imperfect and unsatisfactory. The people of this country are exposed to very great danger, for they can have little or no knowledge of the risks associated with new drugs which are advertised as possessing wonderful curative properties and of the toxic effects of which no mention is made.

The Pharmacy and Poisons Bill at present before Parliament proposes to place the control and sale of poisons under the supervision of an advisory committee called the Poisons Board, on which the medical profession will have a representation, which it is hoped will be adequate. This committee, or Poisons Board, will advise the Home Secretary on the steps to be taken whereby there shall be adequate control of the sale of drugs which may possess poisonous properties, and by this means the public should receive that adequate protection which ought to be afforded to it by the Government.

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LATENT MAXILLARY SINUSITIS.

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INFECTION in the accessory sinuses occurs more frequently than is realised. It is especially common in the maxillary antrum, owing to its lack of dependent drainage. The "common cold" is by far the most frequent cause, although occasionally infection develops after influenza, tonsillitis, or even trauma.

The acute infections are ordinarily very obvious processes, and tend to spontaneous recovery. They are really little more than part of the cold with which they appear. Chronic infection is a much more troublesome problem from both the diagnostic and the therapeutic point of view. It is found in three forms—as a frankly purulent sinus, as a sinus with chronically infected hyperplastic membrane, or as a sinus showing polypoidal degeneration of the membrane.

Both acute and chronic infections have a peculiar tendency to the production of secondary complications, the evidences of which dominate the clinical picture while the symptoms referable to the primary focus in the antrum are either absent or surprisingly slight. This condition I have called latent sinusitis. In its recognition a radiological examination is of especial value. Such cases, if examined, may or may not show intranasal indications of the sinus trouble.

It is difficult to estimate the incidence of such silent lesions. The cases reported are the noteworthy cases from a group of 425 in which the sinuses were X rayed during a routine clinical examination. Of these, 100 were found to show clouding of one or both maxillary sinuses. In 46 of these 100 cases the maxillary antrum was punctured and washed out. In 30 pus was obtained. Of the 30, 6 have been classed as absolute cases of latent sinusitis in so far as the primary sinus lesion was totally unsuspected before radiography, while the symptomatology was that of a secondary complication. In the cases quoted these complications included asthma, severe headache suggesting a migraine, exophthalmos, sudden blindness, possible "tic douloureux," and a painless swelling of the glabella.

From these figures it would seem, therefore, that X ray examination of cases in which any suspicion whatever can be directed towards the nose is worth while. Where there is radiographic evidence of clouding of the antrum, diagnostic puncture seems sufficiently justified and, except in the presence of an acute infection, is harmless. In a similar study of 300 cases, Johnson [1] found that where X ray and clinical findings both indicate pus in the antrum, pus is found in 98 per cent. of cases; but that, where the X ray alone shows clouding and clinical substantiation is lacking, 17 per cent. of cases show pus on puncture. This last figure is very similar to my own finding of 13 per cent.

It will be noted that the positive finding of pus in the antrum on puncture is here taken as the only positive proof of antral infection. The condition of those cases in which washings were negative in spite of a positive X ray is left as an open question. Drea,[2] reporting an analysis of 694 sinus cases, describes the appearance produced by polypoidal or œdematous mucous membrane and finds that about 50 per cent. of cases which show clouding are of this nature, and do not contain pus. In his group 99 polypoidal cases were operated on, and the polypoidal condition was found in 95 per cent. I have not been able to obtain an operative check on such cases. Whether this condition acts as a toxic focus in a similar manner to a toxic empyema or not is questionable. Sluder,[3] in his book, finds that the similar condition in the sphenoid—hyperplastic sphenoiditis—certainly acts as a source of considerable trouble. It would probably be safe to say that, even in the absence of pus on diagnostic puncture, a sinus showing clouding in the X ray, associated with definite clinical evidence of lesions similar to those described in this article, should be considered as potential primary lesions and treated. Where pus is found, of course, treatment is often rapidly efficacious, and the general condition of the patient improves considerably.

The importance of the complications of unsuspected antral infection has been considered extensively in the literature; all kinds of conditions from colitis to melancholia have been reported. The subject, however, has practically always been reviewed in any one article from the point of view of one particular type of complication only. A study of this literature suggests that the types of complication can be divided into several very distinct groups. I have outlined the following groups as distinct, and present illustrative cases and a brief résumé of the literature on each.

1. *Orbital.*—Where the structures within the orbital cavity only become affected.

2. *Intracranial.*—With involvement of the central nervous system.

3. *Cranial.*—Where referred pain via the nerves of the face or head dominates the picture.

4. *Thoracic.*—In which the complicating lesion appears as a disease of either lungs or bronchi.

5. *Miscellaneous.*—Including a group which could be further subdivided but into which only the rarer cases fall.

Orbital Complications.

CASE 1.—A stenographer, aged 26, had suffered considerably from abdominal trouble of various sorts for several years, and her health was generally poor. A year before coming to the clinic she had developed a cold, associated with quite definite soreness about the face and head on one side; her face had never felt quite normal since. She also complained of a slight but constantly troublesome cough since that time.

In October, 1929, she came to the clinic on account of her abdominal trouble, and was undergoing a general examination. On Oct. 1st she developed an acute coryza, but this cleared up very rapidly. Ten days later, on Oct. 10th, she complained of loss of vision in the right eye. This had come on comparatively rapidly over three or four days. She was found to have bare perception of light in the right eye; there was also a slight defect in the left eye. She was given a complete ophthalmological examination and was reported as a "retrobulbar neuritis." The following day, however, she was sent for X ray examination of the sinuses and the right antrum was found densely clouded. The leucocyte count was 8500. Although there was no intranasal evidence of trouble, the sinus was washed out and found to be full of pus. For the next two or three weeks the sinus was washed out regularly until the washings were perfectly clear. The vision gradually improved and in the end returned completely to normal.

CASE 2.—A call-boy, aged 18, came to the clinic in March, 1929, complaining of failing vision and of increasing exophthalmos of one eye, of about eight months' duration. Eighteen months before he had suffered a severe blow on the outer border of the cheek-bone and had a "black eye" for two weeks and a hard lump for months. It is impossible to say whether this injury had any relation to the subsequent developments, but no other history suggesting an ætiology for sinus infection was elicited. He was perfectly well for one year after this blow. A year later he found by chance that he had poor vision in the right eye. At that time he had no proptosis. He had a tonsillectomy and several dental extractions done, but without relief. For the six months before he came to the clinic there had been a slowly increasing protrusion of the right eye without any pain. His only other complaint was of occasional nasal discharge and, more recently, of headache.

On examination the boy was found to have a marked exophthalmos and a proptosis of 1·4 mm. downwards and outwards. There was defect of vision on that side, and ophthalmoscopy revealed an œdema around the edge of the right disc with swelling of the disc to 1·5 D. Nystagmus could be elicited on both sides. There was no intranasal evidence of trouble; the leucocyte count was 10,500. A tentative diagnosis of retro-orbital tumour was made at first.

On radiological examination a generalised clouding of all the sinuses on the right side was found and a pansinusitis reported (Fig. 1). Antral puncture was done and pus found. Surgery was advised. The radical frontal operation from the exterior, ethmoidal exenteration, and a "radical antrum" were performed; the orbit was not opened. An extensive infection was found and wide drainage was established. After the operation the sinuses were washed out repeatedly and the eye slowly began to recede, but at the end of four months it had not returned to normal. Nine months after the operation the patient's mother wrote that he had greatly improved. In April, 1930, however, he returned for a re-examination. There was some recession of the eye, but there was still a very definite exophthalmos and some vision defect. The movements of the orbit were, however, quite free and the patient had become able to focus. The nasal condition was good. The patient said that after the first recession after operation the condition had remained entirely stationary.

A study of papers [3-7] on the secondary effects of sinus disease shows a very extensive bibliography dealing with orbital involvement. This is particularly so in cases of infection of the posterior sinus groups, but also occurs with antral infection. The bony walls of the sinuses separating them from the orbital cavity are extremely thin, and there is a common lymphatic drainage system. Luedde classifies the types of lesion found into two groups, "functional" and "pathological." In the first group he places those cases in which the orbital symptoms are probably reflex. These include photophobia, conjunctivitis, blepharospasm, iritis, excessive lacrimation, and so on. Thomson points out the frequency with which this type of lesion occurs and the extreme importance of early diagnosis. Midway between this group and the "pathological" group lie the cases of so-called "retro-orbital neuritis" produced in all probability by pressure on the optic nerve itself, but without any actual intra-orbital abscess. In these cases blindness occurs, but there are no visible changes in the retina. Case 1 is an excellent example of this condition. The girl's sight was almost certainly saved by the early diagnosis and prompt attention. The condition has been likened by Luedde to "a foot gone to sleep." The pressure probably occurs in the bony canal of the optic foramen, and may be caused by a mild lymphatic œdema.

The "pathological" group includes cases of a more serious type. These occur when the infection actually spreads to and involves the orbital contents. This may cause actual inflammatory involvement of the optic nerve or of any of the other orbital nerves, or it may result in a retro-orbital abscess. These conditions will show as loss of vision, exophthalmos, strabismus, or the like. Case 2 is a good example of the "pathological" orbital group of complications. In view of the incomplete resolution after operation, associated, nevertheless, with a total absence of further advance, the strong probability is that the condition was one of retro-orbital abscess. A more complete cure, but with a greater degree of risk, might have been achieved by opening into the orbit from the nasal exposure. The special interest of this case is the entirely latent and painless onset and course in the presence of such a wide infection.

Almost invariably in these cases perimetric charting discloses the presence of quite extensive scotomata, and the occurrence of these, without other obvious ocular lesion and without retinal changes, is more suggestive of nasal origin than of anything else. These conditions are highly important in so far as prompt diagnosis and clearing up of the primary focus will often save vision that will otherwise be lost, either through secondary optic atrophy or by extension of the process to the cavernous sinus. It has been said that the question of operation should be decided rather by the ophthalmologist than by the rhinologist. Davis makes the statement that treatment is even more urgent in this type of case than in acute mastoiditis.

Intracranial or Cerebral Complications.

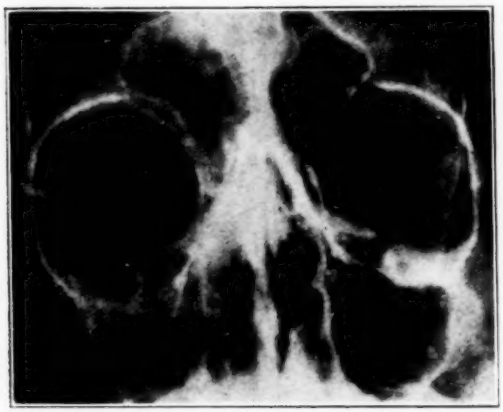
CASE 3.—A housewife, aged 41, had suffered from vague ill-health for about four years owing to a mild degree of cholecystitis. She was, however, otherwise normal. In May, 1929, two weeks before coming to the clinic, she developed a severe coryza, followed by a pain in the right side of the face. This only lasted a very short time, and the dull pain cleared up in a couple of days. A week afterwards she suddenly developed an acute fever with rigor at the onset, and an excruciating pain over the whole right face. Three days later she developed a feeling of extreme dizziness and a staggering gait and came to the clinic.

Examination showed localised supra-orbital tenderness, a right-sided nystagmus, the right pupil smaller than the left, and a staggering gait in some ways suggestive of a cerebellar lesion. The patient was suffering from acute spasms of pain. At first a tentative suggestion of "tic douloureux" was made. The nose was examined and was reported clinically negative. It was noted, however, that cocainisation of the nose relieved the headache to some extent. The leucocyte count was 6000. X ray examination of the skull and of the sinuses was done, and both antra were found to be completely obscured. The antra were washed out and large amounts

of pus obtained. Antral windows were made for drainage. Relief was rapid, and a month later the patient was re-examined and seemed perfectly normal. Subsequently, in April, 1930, she was found to be suffering from recurrent but very mild headaches. The sinuses were X rayed again and were found to be perfectly clear.

Several interesting reports [8 9] have been made on conditions which accurately simulate various types of mental disease but which appear to arise from and to be dependent on the presence of unsuspected

FIG. 1 (Case 2).



Generalised clouding of all the sinuses on the right side.

antral infection. Such cases are very likely to be missed, and this is the more unfortunate in that cure results from effective treatment of the sinus condition. The ætiology is not understood but is presumably a local toxic effect. I have no very striking cases in my series, but Case 3 is illustrative of this process. Looper's report includes cases diagnosed as encephalitis, petit mal, narcolepsy, brain tumour, sudden coma, convulsions, and sudden delirium. In all of these complete resolution occurred after thorough treatment of diseased sinus conditions, which had been unsuspected until specifically looked for.

Cranial Complications.

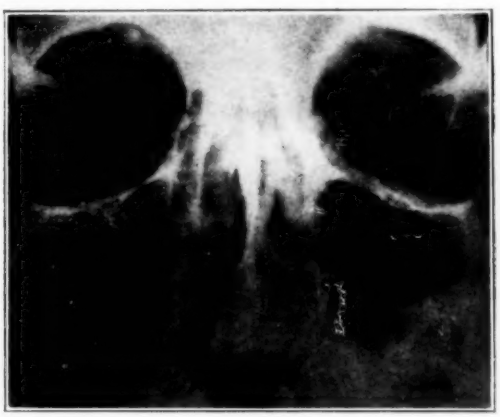
CASE 4.—The patient was a man of 44, normal to ordinary routine clinical examination. For 12 months he had been troubled with severe headaches practically every day. The pain occurred chiefly in the right eye, and over the right forehead and cheek. He stated that the pain was sufficiently severe to influence his mental activity; he felt himself to be duller than usual, and found it quite difficult to concentrate or to think. He gave a history of having had similar trouble three years before, which had been relieved by a dental extraction. He reported an occasional discharge from the right nostril, but the nose had been examined elsewhere and found normal. On clinical examination no causal lesion was found. On otolaryngological examination the nose was passed as normal; the tonsils were condemned as infected. The leucocyte count was 6300; the results of other laboratory examinations were insignificant. X ray examination showed marked clouding of the right antrum (Fig. 2). The antrum was punctured and washed, and frank pus was obtained. The patient was practically relieved of all his pain within a few days of the washing, and continued well as long as he was followed up.

The maxillary sinus is largely supplied by the second branch of the fifth cranial nerve through the spheno-palatine ganglion, and infective lesions within the sinus may originate referred pain in the other branches of, or the skin areas supplied by, the fifth nerve. This will result in headache or neuralgia, often of marked severity. The primary exciting factor is pressure, either the widely distributed pressure of a closed empyema or the more localised pressure produced by inflammatory exudate within the nerve sheaths supplying infected mucous membrane. The pain of the acute closed empyema is typical, and consists of an intense diurnal pain in the face and forehead, especially severe in the mornings, the face often being described as "feeling like bursting." Case 3, apart from its cerebral aspect, is a relatively typical example of an acute closed empyema of the antrum, the dominant symptom being pain. Case 4 is almost equally typical of a chronic closed empyema with tension. The mental dulling is of interest. It may have been secondary to the pain; it may also, however, have been evidence of intracranial toxic involvement, similar to the type described under group 3. The referred pain from the chronic lesions may, however, only affect a single branch of the trigeminal nerve, and show as infra-orbital or supra-orbital neuralgia, ear-ache, pain in the eye, frontal headache, or similar lesions. Sluder, in his book, describes such lesions under the title of spheno-palatine neurosis. It appears that such headaches may be excited as often from the antrum as from the sphenoids and ethmoids, as described by Sluder. In severe cases of lesions in this group, the pain may have all the characteristics of a "tic douloureux," the headaches those of severe migraine.[3 10 11]

Pulmonary Complications.

CASE 5.—A woman, aged 39, a housewife, gave a history of having suffered from "asthma" for three or four years, but before this she had been perfectly well. She gave no history of having had a severe cold at the time of onset of the disease, or any other suggestive history, but the onset had occurred a sufficient number of years before for details to have been easily forgotten. The asthma was constantly

FIG. 2 (Case 4).



Clouding of the right maxillary antrum.

present, and had not shown any seasonal variations. About two years before she had had a tonsillectomy and a nasal operation (nature undiscovered), and had been improved for a period but not cured. The trouble as described by her was not of a paroxysmal nature but consisted of a chronic cough, productive of a moderate amount of mucopurulent expectoration, and a constantly "wheezing" type of respiration.

Otherwise she appeared clinically well, and nothing else was found on routine clinical examination. The white cell count was 8700. As a matter of routine, sinus radiograms were taken; these showed a markedly cloudy left antrum. The antrum was punctured and pus found. The antrum was washed out on four subsequent occasions, pus being obtained every time, but in very small quantity at the last examination. Following this course of antral lavage, the pulmonary condition became rapidly and spectacularly improved.

CASE 6.—A farmer, aged 20, complained of trouble with his throat and the bringing up of large quantities of sputum. He had had his tonsils removed when he was 8 and 12 years old. He had had this trouble for eight years—i.e., from the time of the second tonsillectomy. He always felt as if the throat was filled up, and he was unable to lie on his back without a severe paroxysm of coughing. During the paroxysms he reported that he was in the habit of bringing up large quantities of frothy sputum. Such an attack occurred while the patient was being examined; several cupfuls of highly purulent green sputum were coughed up. After such a cleaning-out he remained free of trouble for several hours.

On examination a severe chronic pharyngitis with considerable hypertrophy of the pharyngeal mucous membrane was noted. Considerable post-nasal dropping was also observed. The chest was radiographed after lipiodol injection, and an extensive bronchiectasis of the minor saccular type was found in the left base. The leucocyte count was 10,000. The sinuses were also X rayed, and clouding was found to be present in both antra (Fig. 3). These were punctured and washed, and pus was found in both. Bilateral "radical antrum" operations were done, and a great deal of degenerated membrane was scraped out. The patient was also put on conservative treatment for his bronchiectasis.

In many ways the most interesting of the secondary complications of sinus infections are those occurring in the respiratory system.[12–16] That there is a sound physiological basis for this has been demonstrated. On the one hand there is a very close inter-connexion of the lymphatic systems of the nose, the nasopharynx, and the thorax. On the other hand, it has been shown that foreign material or secretions from the nose and nasopharynx do find their way, often in sleep, into the bronchial tree. Mullin showed how Indian ink could be injected into the nasal lymphatics or into the sinuses and, later, particles discovered in the ultimate lymphatics of the bronchial tree. They also showed very similar results after the injection

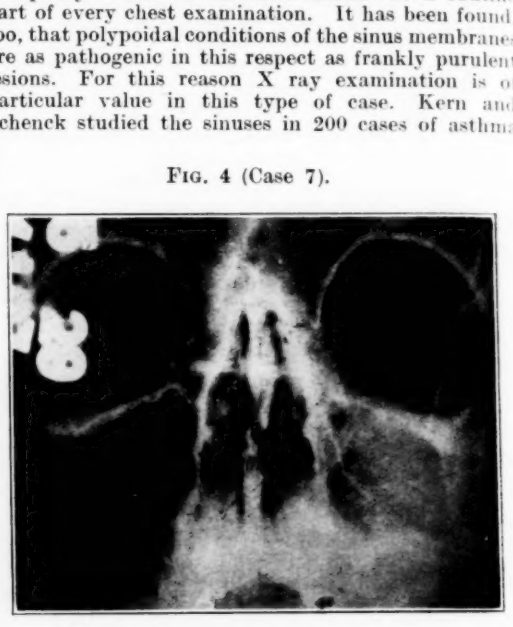
FIG. 3 (Case 6).

Clouding of both antra.

of tubercle bacilli. Quinn and Meyer, on the other hand, demonstrated that lipiodol left in the nose before going to sleep or dropped in during sleep passed into the bronchial tree in five out of 11 cases. It is thus easy to see how infection will carry from the sinuses deep into the lungs.

This relationship has also been shown statistically in studies of the ætiology of pulmonary disease both in the Army and in civil life. This fact has never been pointed out in the text-books—indeed, it was only first noted in 1916 by Rist and Sargent. Excluding tuberculosis or other specific pulmonary infections, a large percentage of pulmonary infections have a primary basis in a sinus lesion. So much is this the case that it has been said that investigation of the nasopharynx and of the nose should be a routine part of every chest examination. It has been found, too, that polypoidal conditions of the sinus membranes are as pathogenic in this respect as frankly purulent lesions. For this reason X ray examination is of particular value in this type of case. Kern and Schenck studied the sinuses in 200 cases of asthma

FIG. 4 (Case 7).



Clouding of the left maxillary antrum.

both by X ray and clinical methods; they found a high incidence of sinus disease, and felt that, although both methods of examination were liable to considerable error, the X ray was of the two the more accurate. They also found that antral lavage is not an absolute criterion and that there are many chronically infected sinuses which do not show pus on washing. Brown has pointed out the frequency and importance of this type of thoracic complication in children.

The most common type of pulmonary infection is a chronic bronchitis productive of sputum and associated with a chronic cough. It is also found as true bronchiectasis, or passing under the diagnosis of "asthma." Case 5 is remarkably typical of reported cases. There was probably no extensive pathological basis within the bronchial tree, and the relief was rapid. If neglected, however, this type of case ultimately goes on to a definite bronchiectasis difficult to handle, such as is seen in Case 6.

In these cases the sinus lesion itself is practically always latent and painless, and very likely to pass unnoticed unless looked for. In one respect this group of lesions differs from those in the previous groups in that once they have become chronic, cure of the sinus lesion is not necessarily followed by resolution of the secondary lesion, although some amelioration of symptoms may occur. The lung lesion has to be treated independently. On the other hand, however, as long as the primary sinus focus remains present, no amount of treatment will relieve the thoracic complications for more than transient periods. For the same reason, prophylaxis is of the greatest value.

Miscellaneous.

CASE 7.—The patient was a young man, aged 22, apparently in perfect health. He came to the clinic on account of a peculiar painless swelling at the root of the nose over the glabella. This swelling was about 2 to 3 cm. in diameter, and raised about 1 cm.; it did not have the characteristics of an inflammatory swelling, was not tender, and was rather

paler in colour than the surrounding skin. It felt doughy in consistency, rather like the œdema of a "white leg." The patient had had a "cold" some six to seven weeks before. On examination the interior of the nose was entirely normal; tumour and frontal bone periostitis were both considered as possible diagnoses. X ray examination of the skull suggested the presence of sinus clouding, and sinus rays showed definite clouding of the left maxillary antrum (Fig. 4). The antrum was washed out and considerable pus obtained. The sinus was washed periodically for the ensuing month. The swelling rapidly disappeared, and to date—one year later—has never recurred. It was presumably due to some peculiar form of local lymphatic obstruction.

While the majority of the lesions fall into the above groups as a natural result of the anatomy or physiology of the parts, yet there is also a small group of lesions which are difficult to classify. As a chronic infective focus an old-standing sinus lesion is always a possible cause for those diseases known to depend on the presence of toxic foci—the arthritides particularly. The sinuses should be as closely studied as teeth and tonsils in any cases where it is essential to eliminate "foci." Mithoefer[17] describes one interesting case of chronic colitis in which the disease disappeared almost immediately after effective treatment of a diseased sinus, the trouble presumably being due to and kept up by the constantly swallowed nasal discharge. Again, nephritis, especially in children, has been found to depend upon the presence of infected sinuses, and to fail to respond to treatment until the sinus had been attended to.

These conditions are illustrative of the possibilities rather than of special groups, and belong really to the interesting or curious findings of internal medicine. Case 7 is an illustration of just such an unexpected and anomalous finding. The types of complication described under the other groups are by contrast far from rare and far from anomalous, and their importance in the realm of internal medicine is still insufficiently realised.[18]

Summary and Conclusions.

Radiological examination of the accessory nasal sinuses often serves to draw attention to cases of antral infection. It may also disclose cases of latent empyema of the antrum, not otherwise discoverable. These cases are those in which the lesions complained of are secondary complications of an unsuspected sinus lesion. Such complications fall into five main groups. The orbital group includes an extensive series of reported cases of defects of vision and orbital complications of serious moment. The cranial group includes those producing headaches, facial pain, or neuralgia of various types. The cerebral group is an interesting group in which disease simulating mental disease is found to be entirely due to sinus infection. The thoracic group has been frequently described recently, and consists of those cases of non-specific pulmonary infection called chronic bronchitis, bronchiectasis, or asthma which are secondary to unsuspected sinus lesions. In addition there is a miscellaneous group in which distant lesions are unexpectedly found to depend on the presence of trouble within the sinuses. Illustrative cases are quoted.

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THE MEINICKE CLARIFICATION REACTION FOR SYPHILIS

IN MENTAL HOSPITAL PRACTICE.

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This paper records the results of parallel Wassermann and Meinicke tests made on 1000 sera forwarded to the Central Pathological Laboratory for routine examination.

Although the Wassermann reaction (W.R.) in the hands of the expert can be relied upon to give consistent and accurate results, it is generally accepted that wherever possible a parallel flocculation test should be made. In well-defined cases of syphilis there is fair agreement between most flocculation tests and the Wassermann reaction, but in treated cases this agreement does not occur, and the relative significance of the differing reactions will be discussed.

Michaelis,[1] in 1907, was the first to observe that precipitation occurred when a syphilitic serum was treated with organ extracts, and since that time numerous flocculation tests depending on this phenomenon have been described—e.g., Kahn, Sachs-Georgi, Sigma, Vernes, and Meinicke. Most of these have been reviewed in the League of Nations Report[2] on the sero-diagnosis of syphilis. The differences in technique depend mainly on the manner in which the organ extract is prepared, and the method by which the resulting flocculation, precipitation, and clarification is observed.

The Meinicke clarification reaction[3 4] follows the Meinicke turbidity reaction; the organ extract is made from ox heart muscle, balsam of tolu is added to it, and the system is adjusted with alkali of varying strength till the isoelectric point of the colloidal suspension is approached, with the result that a positive reaction presents a clear-cut precipitation of the colloidal elements and clarification of the system.

The test can be set up in two forms:—

(*a*) The *macro-reaction*, a procedure which requires 0·7 c.cm. of serum and takes 16 to 20 hours to obtain a complete and quantitative reading; and

(*b*) The *micro-reaction*, which can be utilised where only small amounts of serum are available, as in pædiatric practice, in certain cases in mental hospitals, or where a rapid test is required. The reaction enables a result to be obtained within one hour.

It is claimed that hæmolytic, icteric, and cloudy

(*Continued from previous column.*)

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sera are all adaptable to the reaction, and further that a falsely positive result can never be produced by the admixture of blood or other contaminations with the sera.

Material and Method of Investigation.

The results reported here are taken from sera sent to the Central Pathological Laboratory of the London County Mental Hospitals for the routine W.R. test, and include a large number from cases of general paralysis both before and after treatment. The W.R. tests were made by the method adapted for mental hospital practice which has been used in this laboratory since 1910, and which is now accepted by the Royal Medico-Psychological Association as the standard method.[5]

The technique of the clarification test, as described by Meinicke,[3 4] has been strictly followed, and the specially prepared and standardised "antigen" obtained from Meinicke's Serological Institute, Westphalia, has been used throughout the investigation; a four-tube test has been made on each specimen wherever the amount of serum permitted, failing that, in a few cases only the second and fourth tubes were used.

Some question had been raised as to the occurrence of non-specific reactions in cases of active pulmonary tuberculosis when tested by the older Meinicke turbidity reaction.[6] It was thought advisable, therefore, to examine the sera from such cases by the clarification reaction, and these results have been added.

On each specimen the W.R. and both Meinicke clarification tests were performed, and in the discussion of the main results the reading of the Wassermann is compared with the Meinicke macro-reaction. The results were read quite independently, and certain differences which occurred between the two Meinicke reactions will be discussed later.

In cases where the readings between the W.R. and Meinicke reaction differed inquiries were made into the histories of the patients to ascertain whether (1) there was any history of syphilitic infection, (2) there was any history of treatment for syphilis, (3) there were any clinical signs which might point to syphilitic infection in the absence of history. As a further aid, in a few of these cases it was possible to examine the cerebro-spinal fluid of the patient by the W.R.

Results.

An analysis of the first 1000 cases performed in this manner gives the following results.

1. *W.R. and Meinicke macro-test both negative (787 cases).*—These formed the greatest proportion of the cases, and amongst them were 13 known treated cases whose sera had become negative to both reactions.

2. *W.R. and Meinicke macro-test both positive (179 cases).*—The number of treated cases in this group was 87, and by far the greater proportion of these were general paralytics who had been treated by pyrexial methods (malaria or sulfosin), followed by some organic arsenic compound.

3. *W.R. negative and Meinicke macro-test positive (25 cases).*—Since this is the first group in which a difference between the two tests occurs, it is necessary to discuss it in a little more detail. Included in this number were 13 cases who had been treated for a syphilitic infection, and in whom the Meinicke reaction at the time of examination persisted as a positive, whilst the W.R. was negative. In general, positive reactions to flocculation and allied tests tend to persist longer in the treated cases than do the positive reactions to the Wassermann.

Of the remaining 12 cases, the histories and clinical signs, if any, were investigated.

One patient was a tabetic clinically, and examination of the cerebro-spinal fluid by the W.R. proved to be positive.

Another case also had clinical signs of tabes. The pupils were unequal and reacted very sluggishly to light. The knee- and ankle-jerks were absent, and there was loss of sensation to pin-prick over the forearms and legs. This patient died of pneumonia before an examination of the cerebro-spinal fluid could be made. Two other patients were senile, and had weakly positive reactions to the W.R. on the cerebro-spinal fluid. One other patient was said to have a "punched out" scar on the penis, and to have commenced having fits at a late age. One female patient suffered from corneal ulceration. She had had one miscarriage and 15 children, five of whom had died soon after birth or in the first year of life. In each of the latter cases the reaction of the cerebro-spinal fluid proved negative to the W.R.

The last patient to show any clinical signs was a man aged 48. The pupils were small, equal but irregular, and did not react to light. The knee-jerks were sluggish and the ankle-jerks could not be elicited. Bilateral extensor responses were present. There was no evidence of sphincter trouble. There was no history of syphilitic infection, and the cerebro-spinal fluid was negative to the Wassermann test.

In the remaining five cases both history and abnormal clinical signs were negative.

4. *W.R. positive and Meinicke macro-test negative (9 cases).*—Of this number seven were general paralytics who had been recently treated by malarial therapy followed by organic arsenic compounds. It is in this type of case that the Meinicke reaction appears to fail at times. The two other cases were also general paralytics, but no recent history of antisyphilitic treatment was given.

COMPARATIVE INTENSITY OF WASSERMANN AND MEINICKE REACTIONS.

The Table shows the comparative intensity of the W.R. and Meinicke reaction. The W.R. findings are quantitatively expressed in units of complement adsorbed per c.cm. of serum,[5] and the Meinicke results expressed according to the notation of intensity given by Meinicke in the description of the method [3 4]—i.e., complete clarification in all the four tubes of the test, or, in the fourth tube only, representing a strongly positive reaction and noted ++++, and weaker reactions according to the clarification occurring in the first three tubes, the weakest being noted as + when clarification only occurs in the first tube.

Group.	W.R.	Meinicke.	Cases.	Group.	W.R.	Meinicke.	Cases.
1	+30+	++++	91	4	+10	++++	5
		+++	17			+++	8
						++	1
2	+30	++++	15	5	+7·5	+++	1
		+++	11	6	+6+	+++	2
						++	2
3	+15+	++++	9	7	Neg.	++++	6
		+++	16			+++	15
		+	1			++	4

It will be noted that a strongly positive W.R. is generally associated with a Meinicke reaction of similar intensity ++++ (Group 1), and that with a less marked W.R. (Group 2) the proportion of +++ Meinicke reactions greatly increases. This is also apparent in Groups 3, 4, 5, and 6, but in the majority of cases comprising these groups the W.R. of lesser intensity results from treatment, and it is evident that the Meinicke test shows a slower response to the effect of treatment. The cases in Group 7 also illustrate this finding: of the 25 cases noted, in 13 a negative W.R. followed treatment of

previously positively reacting cases, with the Meinicke reaction remaining definitely positive.

In a recent report on the Meinicke test on 384 sera, by Prentice,[7] it was stated that the macro-test could be simplified by using only the last tube containing diluted serum, and that the reading of the first three tubes is unreliable. The results recorded above in no way support this statement, and it would appear that to make the test with one tube only seriously prejudices its accuracy, and certainly allows of no quantitative reading. Reference to the above Table will show that if a single tube test were adopted, approximately 40 per cent. of positive reactions would be missed. Moreover, the results recorded indicate that readings of the first three tubes are reliable, and have definite significance and support Meinicke's classification of strong and weak reactions. If the complete macro-test is carried out at varying periods after antisyphilitic treatment, it is possible to demonstrate quite clearly the weakening of the reaction in patients who are responding to treatment, as illustrated by the following case :—

Date.	W.R.	Meinicke.
July 25th, 1930 ..	+10	+ + + +
Sept. 1st, ,, ..	Negative.	+ + +
,, 29th, ,, ..	,, ...	+ +

MEINICKE MACRO- AND MICRO-TESTS COMPARED.

The micro-test was also made on all specimens recorded above. There was agreement between the macro- and micro-reactions, except in 12 cases in which the micro-test was positive, whereas both macro- Meinicke and W.R. tests were negative, and four cases in which the micro-test was negative where the macro- Meinicke reaction and W.R. were positive.

The positive micro-reactions of the first group were certainly of the weakly reacting type, but in the absence of confirmatory tests could not be ignored. They probably represent the pseudo-positive reactions referred to by Bousfield.[8] There appears to be no explanation for these false reactions other than the technical limitations of any drop method.

In the second group the variations arise from the fact that the micro- is a one dilution test, and if other dilutions were employed these few reactions might be found to be positive.

Altogether there is a fair agreement between the micro- and macro-reactions, but the few discrepancies noted indicate that the micro- is not so reliable as the macro-test, and should only be employed for reasons of urgency, and then should be confirmed by a subsequent macro-test, or in cases where it is only possible to obtain a few drops of blood.

THE MEINICKE TEST AND PULMONARY TUBERCULOSIS.

Specimens of serum from 30 active cases of pulmonary tuberculosis were examined. In 28 of these both W.R. and Meinicke reaction were negative. In one case both the W.R. and the Meinicke tests were positive, and in the other the W.R. was negative and the Meinicke positive. The latter case falls into Group 3 in the comparison of the main results, and amongst those in which no history or clinical evidence of syphilis could be found. In spite of this one apparently anomalous reaction out of the 30 cases examined, there does not appear to be any reason for believing that non-specific reactions occur in pulmonary tuberculosis.

Discussion.

The figures quoted show that the Meinicke macro- and the Wassermann reactions agree in 96·6 per cent. of the cases examined. It must be stated, however, that the high percentage of agreement bears some relation to the large number of negative results included in the series. If the 213 cases are considered in which a positive W.R. or Meinicke reaction was obtained, the results agreed in 84 per cent. of these cases. Of the 34 cases in which disagreement occurred among the 25 giving a negative W.R. 20 cases certainly had a definite syphilitic history; 13 of this number had previously given positive W.R.'s, which had disappeared under the influence of treatment.

Summarising these findings it will be noted that the majority of the instances of negative W.R.'s, associated with positive Meinicke tests, arose in syphilitic cases in whom the W.R. had been rendered negative by therapy. In only five cases could no specific history be obtained. The nine cases in which a positive W.R. was associated with a negative Meinicke test were clinically cases of general paralysis.

The above figures demonstrate that the macro-Meinicke clarification reaction has many advantages to offer as a parallel test in serological diagnosis by reason of the simplicity of procedure and general reliability. Unlike most flocculation tests for syphilis the reaction is clear-cut, and the end-point easy of interpretation. Fluctuations of temperature are more liable to affect the reaction in the first three tubes of the test than in the fourth, and where the heating arrangements of the laboratory are not operating throughout the night, the temperature of the room in which the tubes are placed may fall well below the optimum for the reaction (20° C.). To obviate this we found it necessary to place the racks containing the tests in an incubator set at 20° C. Meinicke stresses the importance of the temperature, and a short experience during the colder months served to emphasise this important point.

The results recorded indicate that a positive Meinicke in the presence of a negative W.R. may have some clinical significance, or in any case the positive Meinicke may persist in a treated case after the W.R. has become negative. It is, however, possible for a few negative Meinicke reactions to occur in definite syphilitic cases giving positive W.R.

The macro-test has proved more reliable than the micro-test, for whilst a specific case is rarely returned as negative, even when using one dilution with the micro-technique, pseudo-positive results may occur. In the macro-test wherein four tubes are used and larger amounts of the reagents are employed, no difficulty arises in reading clearly and correctly the result of the reaction.

Summary.

1. An analysis is made of 1000 parallel Wassermann and Meinicke clarification tests on sera from patients in the London County Mental Hospitals. An agreement has been found in 96·6 per cent. of the total.

2. Of the 34 cases showing a disagreement in the results of the two tests, 25 were negative to the W.R. and positive to the Meinicke test, and 9 showed a positive W.R. with negative Meinicke results. Of the former group, 13 had been treated for syphilitic conditions, 7 gave histories or signs of syphilitic infection, and in the remaining 5 cases no syphilitic history or clinical signs could be elicited. The latter group of nine cases were all confirmed clinically as general paralytics.

3. Evidence is produced to show that the Meinicke reaction tends to persist longer with the sera of treated cases than does the W.R.

4. The micro-test shows a 95·1 percentage agreement with the macro-test, but whilst representing a

useful rapid test where only minute quantities of blood are obtainable, it has not the same degree of reliability as the macro-technique.

5. The Meinicke macro-test is a useful parallel test to the Wassermann, especially in view of its simplicity of manipulation, clarity of results, and comparative freedom from non-specific positive reactions.

6. It is important to carry out the test in four tubes according to Meinicke's original technique, and the statement of Prentice that it can be made a one-tube test cannot be supported.

In conclusion, we would thank Dr. F. L. Golla, director of the laboratory, and Dr. S. A. Mann for their encouragement and advice in the course of this investigation.

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OCHRONOSIS.

REPORT OF A CASE WITH CARBOLURIA.

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THIS case was diagnosed clinically on the grounds laid down by Osler,[1] who was the first to recognise the condition during life in three cases associated with alcaptonuria.

The patient, who was sensitive about her condition and reluctant to be the subject of investigation, was seen by one of us in 1927 when the diagnosis was made, but it was not until 1930 that she consented to help towards some of the results given in this paper.

Clinical History.

Condition in 1927.—Mrs. A., aged 59, complained of a progressive darkening of the skin of her face, which she thought had commenced about eight years before. The skin of her face was a uniform yellow-brown colour, except over the nasal cartilage, where it had a purple-blue tint. This gradually merged into the yellow-brown colour over the cheek in a butterfly-wing shaped area on each side. By standing well away from the patient, the observer gained from the purplish areas the impression of a butterfly's shadow over the face with the nasal cartilage forming the body; this, however, is not very well demonstrated in the photograph (Fig. 1). The sclerotics showed triangular symmetrical patches situated midway between the cornea and the canthus. The patches of pigment were deep to the conjunctiva, black in the centre and brown towards the margins, the four triangular areas being of approximately equal size and intensity of pigmentation. The base of each triangle was nearest to the corneo-sclerotic junction and the two sides ran nearly parallel with the margins of the lids. The ears presented the same peculiar purplish-blue pigmentation as that over the nasal cartilage, the concha being the most deeply stained. The aural cartilage was unduly rigid.

The hands showed a bluish tint on the skin over the thenar and hypothenar eminences, but there was no pigmentation of the nails. The flexor tendons at the wrist showed grey through the skin. The urine, when first seen, was yellow, contained a large amount of mucus and had a faint indefinable odour. The reaction was slightly acid to litmus and the specific gravity was 1016. Albumin was absent and Fehling's solution was not reduced but discoloured. Ferric chloride gave no blue colour. Microscopical examination of the deposit showed a few squamous epithelial cells and a few uric acid crystals. The urine on standing, darkened to a deep sepia tint within twelve hours but never became quite black. Decomposition did not occur on keeping for three days. On these grounds, the diagnosis of ochronosis was made.

FIG. 1.

Photograph showing pigmentation of face and hands.

Condition in 1930.—The patient was seen at various times during the years 1928, 1929, and 1930. On Jan. 23rd, 1930, she consented to physical examination. The examination revealed two large ulcers, one on each leg around and above the ankle. They completely encircled the leg and were about 10 cm. in width, the base of each consisting of unhealthy granulations. The skin at the edges was pigmented, but the pigmentation resembled that seen around old varicose ulcers rather than the characteristic tint of ochronosis. She now admitted the existence of the ulcers since she had had "white leg" in pregnancy forty years previously; they had been dressed with 5 per cent. carbolic acid lotion for a period of 35 years. This at once extended the investigation, since ochronosis has been recognised as being the outcome of alcaptonuria and also of the prolonged absorption of carbolic acid. With a view to ascertaining the true state of affairs, we proceeded to make a series of examinations on the urine—under certain difficulties, because the patient at that time was unwilling to be taken into hospital. On Oct. 13th, 1930, she was admitted to the General Hospital under Prof. W. H. Wynn, who gave us facilities for continuing our research and to whom we should like to express our thanks for his kindness. Daily samples of the urine were collected and dealt with in the manner set forth in the second part of the biochemical portion of this paper.

Condition in 1931.—The patient left hospital on Nov. 20th, 1930, the carbolic acid dressings being discontinued. No alteration in pigmentation

of the skin, either in distribution or depth, was evident. The ulcers were healing with acriflavine dressings. She complained of backache and aching joints. Some arthritis was present in the back and knee-joints (? osteo-arthritis ochronotica). The urine was normal.

Chemical Investigation of the Urine.

PRE-HOSPITAL PERIOD.

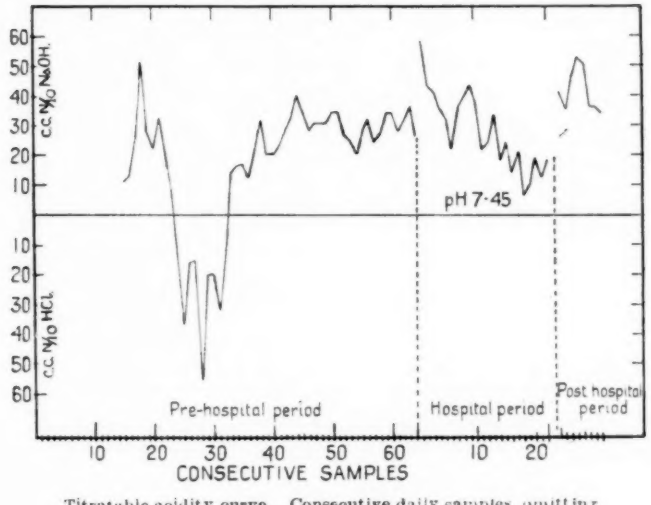
Between April and September, 1930, samples of the urine were obtained daily, but no data were available as to the time when it was passed or the diet taken. The urine was usually clear but contained for a period a large deposit of phosphates and mucus, coinciding with the period of alkalinity referred to later; the colour varied from the normal yellow to a smoky black. It usually darkened on keeping, this darkening process being greatly accelerated in alkaline solution. The darkening occurred at the surface and spread downwards, indicating an oxidative process. It was found by a series of experiments, using the Lovibond tintometer, that the darkening process was most rapid at pH 9·2.

Titratable acidity (on 90 samples) (Fig. 2).—The urine was usually acid, the titratable acidity varying from 10 c.cm. to 50 c.cm. N/10 NaOH per 100 c.cm. of urine, the mean value being 30 c.cm. N/10 NaOH per 100 c.cm. of urine. A notable exception occurred with ten consecutive samples which were on the alkaline side of the blood pH (7·45), varying from 14 c.cm. to 56 c.cm. N/10 HCl per 100 c.cm. of urine. This alkaline period was never repeated during the course of the investigation.

Sulphates (on 10 samples). The relative proportions of inorganic and ethereal sulphates varied only very slightly, the mean value for inorganic sulphate being 4 mg. SO_3 per 100 c.cm. urine, and for the ethereal sulphate 129·1 mg. per 100 c.cm.

Glycuronates (on 1 sample).—The glycuronic acid in one sample was estimated by Tollens' method[2] and found to be 77 mg. per 100 c.cm. of urine. This is three times the normal value as given by Tollens. The same sample of urine showed ethereal SO_3, 87·8 mg. and inorganic SO_3, 4·0 mg.; hence the ratio of glycuronolactone to ethereal SO_3 is 0·9 : 1. In normal urine, where the absolute amounts of glycuronolactone and of ethereal sulphate are very much smaller, Tollens [2] found the rates to be 2 : 1.

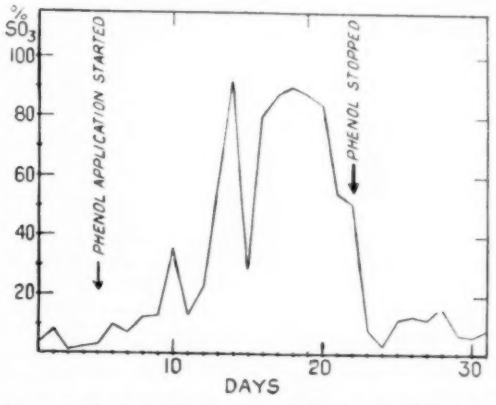
FIG. 2.



Titratable acidity curve. Consecutive daily samples, omitting week-end specimens.

Phenol.—The phenol was isolated as tribromophenol by distilling the urine with 5 per cent. hydrochloric acid (in later experiments with 5 per cent. sulphuric acid) and subsequently adding bromine to the distillate. The melting-point of the tribromophenol, once crystallised from 70 per cent. alcohol, was 87° C. No depression of the melting-point occurred in admixture with an authentic specimen. The amount of the bromo-compound obtained corresponded to 190 mg. of phenol per 100 c.cm. of urine. Probably the whole is present as sulphate and glycuronate.

FIG. 3.



Curve of urinary sulphate percentages. It should be noted that week-end specimens were not obtainable.

Homogentisic acid.—Repeated attempts to isolate homogentisic aid by the method of Garrod [3] were without success. The urine was heated to 90° C.; neutral lead acetate (5 g. per 100 c.cm.) was added and the solution was filtered hot. On cooling, a very small crystalline deposit (2·9 g. from 3500 c.cm. of urine) was obtained. The greater part of this proved to be lead chloride. The remainder after removal of the lead gave no colour with ferric chloride; did not reduce Fehling's solution; reduced ammoniacal silver very slightly, and did not progressively darken in potash solution—i.e., was not homogentisic acid.

Extraction of the Urine with Ether.—The urine was extracted in a "rocker" extractor with ether, and simultaneously the acidic extracts were absorbed from the ether either by N/10 NaOH or N/10 $Ba(OH)_2$, the former being the more satisfactory. The extraction was usually continued for four days. The alkaline solutions so obtained, which were usually black, were made acid to Congo paper with sulphuric acid and extracted with ether. The ether extract, after drying over calcium chloride, had the ether removed by distillation. The residue was then fractionated by vacuum distillation or vacuum sublimation or both.

(*a*) *Urine acidified with HCl.*—The ether extract distilled at 15 mm. yielded phenol, hydroquinone, and a little benzoic acid. Evidence for hydroquinone: the highest boiling fraction of the distillate (at 15 mm.) was crystalline. It crystallised from benzene in fine needles, M.P. 165–167° C. There was no depression in melting-point on admixture with an authentic specimen of hydroquinone (M.P. 168–169°). It immediately reduced ammoniacal silver nitrate and Fehling's solution and it turned dark in colour in alkaline solution. It gave no coloration with ferric chloride and on boiling with this reagent quinone was formed.

(*b*) *Urine acidified with sulphuric acid.*—The ether extract distilled and sublimed at 15 mm. gave phenol and much benzoic acid but no hydroquinone. A small quantity of substance, M.P. 120–174° C. (obviously impure), was also isolated. This unknown gave negative tests for hydroquinone. A black tar always remained after these distillations. The tar was soluble in sodium hydrate solution but not in sodium carbonate.

(c) *Hydrolysed urine.*—The urine was made acid to Congo red with sulphuric acid and refluxed for one hour. It was then extracted with ether in the above manner. Repeated fractionation in vacuo of the extract enabled phenol, benzoic acid and a minute quantity of an unknown substance, M.P. 124–126° C., to be isolated but no evidence was obtained of the presence of hydroquinone or of homogentisic acid. The unknown substance, the quantity of which was too small for analysis, was not the pigmenting substance, as it did not darken in alkali. Benzoic acid was obtained from an extract by crystallisation and without distillation or sublimation, showing that it was not a heat decomposition product.

(d) *Urine made alkaline with sodium carbonate.*—The ethereal extract was extremely small and consisted chiefly of benzoic acid.

Thus, the urine obtained during the pre-hospital period treatment was carboluric and darkened in alkaline solution. (This change in colour was simulated by adding hydroquinone to normal urine). The titratable acidity was, on the whole, normal with one notable exception, when for ten days the urine was strongly alkaline. Phenol was invariably present, apparently as sulphate and glycuronate, and practically the whole of the sulphate was present in ethereal form. No evidence whatever was obtained of the presence of homogentisic acid. Phenol and benzoic acid were invariably present in ethereal extracts, and in one sample hydroquinone was found also. Careful search, however, failed to show its presence in subsequent samples. The benzoic acid is probably present in the original urine as hippuric acid, which is known to be hydrolysed by acid in the cold.

HOSPITAL PERIOD.

Phenol treatment discontinued.—The patient was on a mixed diet and the urine was collected in 24-hour samples. The phenol treatment was discontinued and replaced by fomentations. The first sample of urine for analysis was obtained eight days after admission to hospital. This urine was normal in colour and did not darken on being made alkaline and allowed to stand. The titratable acidity was on the acid side (58·8 c.cm. N/10 NaOH). Inorganic sulphates were: 312·0 mg. SO_3 and ethereal sulphates 12·8 mg. SO_3 per 100 c.cm. of urine. The proportion of ethereal to total sulphates is as 4 to 100.

Return to Phenol Treatment.—After five days, during which the urine remained normal, the patient consented to the phenol applications being resumed for experimental purposes. The titratable acidity and the total (T) and ethereal (E) sulphates were determined daily. A slow fall in the titratable acidity occurred, and continued until the period in hospital ended, when the value was 15 c.cm. N/10 NaOH per 100 c.cm. urine. Fig. 3 shows the variations in the proportion of ethereal sulphates—i.e., of $\frac{E}{T} \times 100$. For four days after the beginning of the phenol treatment to the ulcers, there was no change. Thereafter a rise occurred reaching a maximum of 94 per cent. on the ninth day following phenol application. The subsequent values remained high until the twenty-first day, when the patient was discharged from hospital and the phenol applications stopped. Coincident with this increase in ethereal sulphates, phenol was isolated from the urine as tri-bromophenol. The colour intensity throughout this period was normal and no darkening occurred on making alkaline and allowing to stand, showing that the pigmentary substance, even if it was being formed from the phenol, was not being excreted in the urine.

POST-HOSPITAL PERIOD.

Eight days elapsed before the first home sample was obtained. The phenol treatment had been replaced by acriflavine dressings, and no phenol was detected in the urine. The titratable acidity (Fig. 2) was much higher when the patient was discharged from hospital, but it remained fairly steady during the remainder of this period. The sulphates were already back to normal values—viz., ethereal 9·6 mg. and total 108·8 mg. per 100 c.cm. of urine; therefore $\frac{E}{T} \times 100 = 8{\cdot}8$.

Conclusions.

1. A case of carboluric ochronosis is described, analogous to the cases described by Virchow,[4] Pope,[5] Pick,[6] Reid,[7] Beddard [8] and Beddard and Plumtre.[9] (2) A more extended analysis of the urine has been undertaken than in cases previously described, to try and determine the nature of the pigmenting substance or its intermediaries; (3) the pigmentation of the urine observed in this case is traceable directly to the use of phenol applications to the ulcers; (4) the nature of the pigmenting substance formed from the phenol has not been determined. Hydroquinone, which would satisfy the conditions, was found in but one sample of urine. The further investigation of the problem must be postponed until further samples of pigmented urine are available; (5) the formation of the pigment appears to be an oxidative process with an optimum pH of 9·2.

The authors wish to thank Prof. I. de Burgh Daly for his interest and criticism.

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OBSERVATIONS ON CHRONIC URTICARIA.*

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URTICARIA is the term applied to the skin manifestation of a reaction of the smaller blood-vessels, characterised by the formation of transient, itching wheals. In the first place, it is important to appreciate that this is an evidence of a normal reaction, protective in character and probably one of the many mechanisms of defence with which the skin is endowed. It is common knowledge that an urticarial reaction is the normal reaction to certain stimuli—e.g., the sting of the nettle and some other plants, the bites of certain insects, the lash of a whip and the injection of certain substances, such as histamine. It is, however, of equal importance to bear in mind that this reaction of urticaria is a reaction of blood-vessels and not of the skin, so that it occurs in many, indeed most, other organs. Urticaria of the lungs is recognised as asthma, urticaria of the upper respiratory passages is common; in the gastro-intestinal tract it is responsible

* Read before the Bradford Medico-Chirurgical Society on April 14th, 1931.

for diarrhœa and vomiting, amongst other disorders; and in the brain it probably accounts for much of the mental irritability associated with urticaria of the skin, as well as for faintings and hysterical manifestations.

PROVOCATIVE AGENTS.

Provocative agents are so numerous that it is almost impossible to detail them in full, but the following groupings give a fair impression of the more usual ones.

1. *Physical agents.*—trauma, cold, heat, light, chemical irritants, the juice of some plants, the bites of certain insects and parasites. This group causes a type of urticaria rather distinct from the morbid state which is commonly conceived in using the term urticaria, and referred more nearly to the type of urticaria which can be evoked in the normal subject. The reaction is essentially local to localised injury of the skin from without and, although it implies some degree of hyper-sensitivity, it is not a constitutional disorder like chronic urticaria. Most of the provocative agents cause urticaria by virtue of some "poison" gaining access to the blood stream. The nature of the poison is seen in the following groups.

2. *Poisons gaining access via the alimentary canal.*—(*a*) The result of bacterial infection of the canal. (*b*) Ptomaines and products of decomposed food and fermentation. (*c*) Certain particular foodstuffs, as shell-fish, tinned foods, game and certain fruits. (*d*) From normal common foods, as eggs, fish, meat, &c., due probably to incomplete digestion, with the result that complex protein molecules gain access to the blood stream. (*e*) Drugs.

3. *Substances injected directly into the blood stream*, usually of an organic nature—e.g., sera and arsenobenzol preparations.

4. *Toxins and toxic bodies* emanating from a focus of infection, from abnormal metabolism (as in pregnancy or malignant tumours), and from the use of vaccines.

5. A final group with no obvious toxic or poisonous character is that comprising *emotional or nervous disturbances* which are a frequent cause and a more common complication of urticaria.

I have enumerated this list of causes rather from a sense of duty than from any conviction as to their serious practical importance. I am sure that all these agents mentioned, and numerous other irritants, are capable of provoking urticaria, but I believe that many of them are so rarely the true cause as to constitute mere medical curiosities. Focal sepsis as a cause is rarely seen; urticaria is not commonly found in havens of focal sepsis such as dental hospitals, ear, nose, and throat departments, and departments for the treatment of gonorrhœa. Similarly urticaria, due to abnormal metabolic activities in pregnancy, or in cases of malignant tumours, is very rarely seen.

The patient and fruitless search by practitioner and dermatologist for a specific normal foodstuff as a cause of chronic urticaria suggests that these cases also are few and far between. Indeed, a serious consideration of any large number of cases leads one to the belief that "poisons" gaining access through the alimentary canal and psychological disturbances constitute the causes in the great bulk of cases of chronic urticaria. I think these are the essential and important causes to be dealt with in any practical consideration of the subject. The one group of cases is dependent upon the phenomenon of sensitisation, the second upon the nervous or emotional constitution of the patient or circumstances affecting this constitution.

Clinical Features.

Intense itching and the presence of wheals which come and go within the space of a few hours are the essential diagnostic features of urticaria. Apart from the common type, we recognise factitious, bullous, giant, and papular forms of urticaria. Factitious urticaria belongs more to the group referred to above as dependent upon physical agents. Bullous urticaria is the result of an unusually rapid outpouring of fluid, due either to the quality of the poison acting upon the vessel walls or to the hypersensitiveness of the vessels themselves. Giant urticaria is dependent upon an affection of the deeper blood-vessels, and this type is usually closely related to nervous and emotional causes. The main clinical consideration for us is that urticaria occurs either as an acute or as a chronic disorder.

In the main, *acute urticaria* is a manifestation of food poisoning—that is to say, it is dependent upon some poison ingested and entering the blood stream by way of the alimentary canal. It is associated with intense itching and intense mental irritability. Nature often tends to cure the condition by vomiting and diarrhœa. Any treatment should be purely eliminative, and the administration of calomel at night and a saline aperient in the morning are the most effective measures towards bringing an acute attack of urticaria to an end. We should particularly avoid the administration of sedatives, which will tend to retard elimination and favour the retention of the poison within the system. Morphia, bromides, or luminal should never be used, though the temptation to employ them is never greater than when dealing with cases of acute urticaria. Relief of the distressing itching and the mental irritability can usually be achieved by the hypodermic administration of adrenalin, atropine, or pilocarpine, which may be repeated as necessary.

A consideration of the nature of *chronic urticaria* is instructive in reminding us of the intimate association between the practice of dermatology and the practice of general medicine. The presence of a chronic functional disorder in the skin, as in any other organ, presumes the presence of a susceptible skin which, in the majority of cases, means some constitutional variation from the normal, often no more than constitutional nervous sensitiveness. This is probably the most important consideration in the treatment of such disorders of function as chronic urticaria, but two other factors must always receive due consideration. The first is the precipitating cause, the provoking agent of the disorder, since this may be, though it often is not, still active. The second point is that any functional disorder of the skin, once it has been started, may persist of itself, by virtue of its own momentum, in the nature of a habit.

Of all the possible provocative causes of urticaria, few are of practical importance in the chronic stage other than: (1) poisons gaining access by the alimentary system, often starting from acute urticaria; or (2) emotional causes. It follows that most of our problems in this branch of medicine are elucidated by a consideration of these two features.

Alimentary causes of chronic urticaria are not commonly of the nature of ptomaines or gross poisons, even when acute urticaria passes into chronic. It is not true, obviously, that ptomaines persist indefinitely in the system, though the reactions to the injury they provoke may persist either from incorrect treatment, or from constitutional factors summed up in the term "sensitiveness of the skin," or from

habit. The alimentary causes of chronic urticaria are of the nature of sensitisation, either specific (to a particular food) or non-specific sensitisation (to a great variety of foodstuffs, which variety is often not the same even from day to day). It may possibly be due to the absorption of toxic bodies or to the chemical changes in the blood which accompany constipation and consequent fermentation. The latter features, of course, are corrected by removing constipation. For the detection of sensitisation to specific foods, the method of skin tests offered great hope from the theoretical point of view, but has proved, in practice, of little value. Of more benefit is the keeping of a diary of the exact foodstuffs taken and the exact times of attacks of urticaria, when any correlation between the foodstuff and the urticaria is usually brought to light. If no such cause is found, it is not necessary or desirable to resort, with scant satisfaction, to some such vague but non-committal cause as focal sepsis, endocrine imbalance or biochemical derangement, in the absence of evidence, or to institute an interminable hunt for an elusive antigen.

It may be, and often is, true that some minor derangement of physical health or of mental equilibrium is permitting the persistence of a functional disorder which would disappear upon its correction, or it may be that the disorder of function has been allowed to persist for so long that now, in spite of good health, the habit continues. In the first instance, in the absence of a specific cause, we are called upon to restore the patient to normal health, and any disabilities discovered in the course of a reasonably careful clinical examination should be dealt with to this end. Examination of the urine should not be neglected; infected teeth should not be left in situ, in view of their possible secondary effects upon the general health; constipation should always be corrected; and habits of diet and meals should be put upon a normal basis. Undue nervous sensitiveness and particularly inadequate nervous rest, including sleep, should be inquired into, as should environmental factors, which may be exerting undesirable influences upon the physical or mental well-being. If such attention does not correct the disability, we should consider the possibility of bringing to an end the bad habit by sedative or shock measures. It should be borne in mind that urticaria is not uncommonly precipitated by an acute emotional upset or nervous shock and also that, being a highly sensitive vaso-motor nervous disorder, even if the acute precipitating cause has not been emotional, psychological factors will very readily step in as secondary provocative agents, once the reflex has been established. There is probably no group of skin affections or of medical disorders in which minor emotional disturbances play a greater part than in the production or persistence of chronic urticaria, and no case of chronic urticaria has received adequate consideration until this aspect has been reviewed.

Treatment.

The first measures instituted should obviously be eliminative, with a view to removing any possible poison emanating from the bowels and to correcting constipation. A great number of cases of chronic urticaria will clear as a result of these measures. In the second place, the general health and habits must be overhauled, any disorders found should be corrected and every effort should be made to see that the patient enjoys good and normal health. The dietary of the patient should next be reviewed, with a view to finding a possible cause in a specific foodstuff. If no specific cause is found, no useful purpose is served by dieting the patient stringently, on the contrary, full and normal diet should be taken. Too often one sees patients suffering from chronic urticaria in a state of starvation, and the restoration of normal diet does much to bring about recovery. Having conducted these preliminary investigations and corrections, the most important features in treatment are the internal measures prescribed. They fall into two groups: (1) measures of desensitisation and shock therapy; (2) measures directed towards the relief of nervous or emotional instability.

MEASURES OF DESENSITISATION.

If a specific protein is found to be the cause of the urticaria, the line of treatment is to exclude it from the dietary, or to endeavour to desensitise the patient by repeated ingestion or injection of small quantities of the offending substance. More commonly, no one specific foodstuff is found to be the cause. To deal with a general sensitisation to foodstuffs, the patient may be given a miniature meal one hour before the proper meal and of similar composition. This, however, is not a very practicable procedure and the same end is achieved by giving peptone, usually 0·5 to 1 g., one hour before meals. This is one of the most valuable measures in the treatment of chronic urticaria.

General desensitisation may be achieved in the same way by: (1) the intravenous injection of peptone once or twice daily, for a short period—5 c.cm. of a 5 per cent. solution usually being employed; or (2) the use of vaccines—e.g., T.A.B.; or (3) auto-hæmotherapy—the injection of 10–20 c.cm. of the patient's whole blood, taken from a vein at the elbow and immediately reinjected into the muscles of the buttock. Of all the measures demanding the use of the needle, auto-hæmotherapy is by far the simplest and often gives good results.

In this same class of treatment may be mentioned the administration of sodium hyposulphite, which may be given by mouth, or, more effectively, intravenously. This measure, which probably acts by its influence on the tissue cells, is more uncertain in its effect than the measures previously enumerated.

SEDATIVE MEASURES.

These provide the second line of attack upon chronic cases of urticaria. If, as is often the case, nervous influences are obviously playing the major part in the case, then this line of treatment will be adopted from the start. Its rationale presumes that hyper-excitability of the central nervous system is responsible for the exaggerated functional reactions, of which urticaria is the evidence. The most valuable measure here is probably potassium bromide, which is best given with sal volatile and nux vomica, as in the following prescription from the London Hospital Pharmacopœia: Pot. brom. grs. 10, sp. ammon. arom. ℥ 15, tinct. nucis. vom. ℥ 4, infus. gent. ad. oz. ½ t.d.s. p.c. Luminal in small doses—gr. ¼, or gr. ½—is exceedingly valuable. Valerian, phenacetin, and antipyrin are likewise of value, but are rarely as efficacious as bromides and luminal. It is quite hopeless to practise this line of treatment in a half-hearted fashion. If the diagnosis of the cause of a case of urticaria is correctly attributed to nervous influences the results of bromide or luminal therapy will probably be dramatic but will serve no good purpose at all if the treatment is stopped as soon as the symptoms are relieved. By means of sedatives one restores to normal a disturb-

ance of function which has established a bad habit. It is also wise to take the patient gradually and not suddenly off sedatives used in this manner.

Another weapon of the same class, acting locally and not centrally, is superficial X ray therapy. A small application of X rays to the skin will restore normal function for a period and a few small applications, repeated at long intervals, will tend to restore normal function in much the same way as the administration of sedatives internally. Its great disadvantage in the treatment of urticaria lies in the fact that X ray administration to the whole of the surface of the body is a tedious procedure and is accompanied by a certain amount of temporary constitutional shock and depression.

TREATMENT OF CHRONIC PAPULAR URTICARIA OF CHILDREN.

This variety of urticaria, which is almost confined to children between the ages of one and three or four years, is probably dependent upon the two factors stressed—namely, a constitutional nervous sensitiveness and sensitisation of the skin to irritants gaining access by way of the alimentary canal.

Treatment should be directed, in the first place, towards correcting possible alimentary disorders and, if unsuccessful, should be combined with treatment of the nervous factor. In infants hyd. cum. cret., and in older children a mixture of rhubarb, magnesia, and bicarbonate of soda, will correct the disorder in the majority of cases. Most of those cases which resist such measures will be corrected by the simple addition of potassium bromide grs. 4 or grs. 5 t.d.s.

Local measures in the treatment of chronic urticaria of adults or children can afford no more than a measure of relief of the subjective symptoms and can do nothing towards curing the condition. Warm baths —often with the addition of bran—are comforting. Calamine lotion or liniment, with or without 1 per cent. carbolic acid, is usually sufficient by way of local application.

Urticaria should respond readily to treatment directed along correct lines. It does not serve any useful purpose to persist with a course of treatment in such chronic functional disorders unless favourable progress is apparent, for the cure of the disorder, if this eventually occurs, is more correctly attributed to time than to the treatment. In these circumstances the measures prescribed should be revised or withdrawn, for unnecessarily elaborate treatment sometimes encourages the persistence of such a disorder.

CLINICAL AND LABORATORY NOTES

ACUTE MONOCYTIC (HISTIOCYTIC) LEUKÆMIA.

By W. E. Cooke, M.D. Liverp., M.R.C.P. Lond.,

DIRECTOR OF PATHOLOGICAL DEPARTMENT, WIGAN INFIRMARY: CONSULTING PHYSICIAN AND CONSULTING PATHOLOGIST TO LEIGH INFIRMARY.

Reschad and Schilling-Torgau[1] described the first case of acute monocytic leukæmia in 1913. From that time to 1930 29 cases have been recorded, but Dameshek (1930)[2] reduced this number to 18, which included two cases described by himself. The reasons for his rejection of the other cases were that some were definitely myeloblastic leukæmia, others were of the acute myelocytic type, and some could not be differentiated from agranulocytosis. His rejection of these will be upheld by anyone reading the case reports.

THE PRESENT CASE.

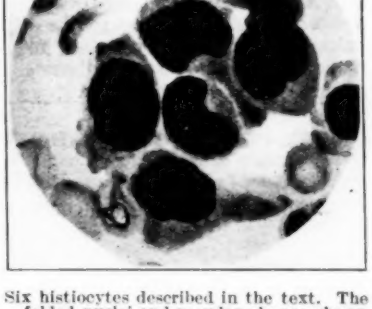
The patient was a boy, aged 19 years, a French polisher by trade, under the care of Dr. H. B. Lawrie, of Sabden, Lancashire. He was always healthy until August, 1930, when he was seen by Dr. Lawrie, but his family had noticed that he had looked pale for two months previously. When seen on Sept. 2nd he had had occasional rises of temperature—up to 100° F.—for the past three weeks, had become markedly paler, and had had some epistaxis and bleeding from the gums. The tonsils were large, and the gums swollen and granular. The spleen was enlarged, and extended 3 inches below the costal margin. The superficial glands were not enlarged, nor were there any petechial hæmorrhages. Blood examination on that date showed:—

Red cells	1,260,000	Polymorph	4%
White cells	49,800	Lymphocytes	9%
Hæmoglobin	22%	Monocytes	87%
Colour-index	0·9		

Thrombocytes very scanty. Monocytes all oxidase-negative.

The patient died on Sept. 12th. Autopsy was not allowed.

The "Type" Cell.—The normal monocyte of the blood stream was rarely seen in the films. The normal monocyte measures from 12 to 14 microns in diameter. The nucleus is large, varies in shape—rounded, indented, or horseshoe-shaped—and consists of a fine reticulum of chromatin. Nucleoli are not present. The cell is commonly oval, and sometimes presents cytoplasmic projections or pseudopodia. The cytoplasm stains a bluish-grey with Giemsa, and contains scattered azurophil granules. These cells are faintly oxidase-positive, the granules being very fine and scanty. The type cell of the present case differs from the normal monocyte in several important particulars. The cell is generally larger, measuring from 14 to 40 microns in the longest diameter. The nuclear structure appears even finer, and the shape of the nucleus shows more irregularity than in the monocyte. The nucleus is frequently folded upon itself and may show two or more folds. Nucleoli are not present. The cells take on innumerable shapes owing to the presence of pseudopods of different lengths and sizes (see Figure). The cytoplasm stains rather a lighter greyish-blue than that of the normal monocyte, and many of the cells contain very fine granules which are oxyphil and stain a reddish-pink with Giemsa, in contrast to the azure granules of the monocyte. The granules are often grouped round the nucleus. Furthermore, these cells are all definitely oxidase-negative. All stages from this cell to the normal monocyte may be traced in the films.



Six histiocytes described in the text. The folded nuclei and pseudopods are shown (× 1000). *Photomicrograph by W. E. Cooke and C. F. Hill.*

DISCUSSION.

The type cell in the above case was identical with the histiocyte (hæmohistioblast, clasmatocyte, or

[1] Reschad, H., and Schilling-Torgau, V.: Münch. med. Woch., 1913, lx., 198.
[2] Dameshek, W.: Arch. Int. Med., 1930, xlvi., 718.

monoblast of various writers), and the case should be classed as an acute monocytic or histiocytic leukæmia.

There still appears some doubt whether monocytic leukæmia exists as a clinical entity. From examination of the previous 18 cases, and from consideration of the present case, I conclude that monocytic leukæmia does not differ clinically from the other acute leukæmias. It appears at any age from 5 to 78 years, but most of the cases have occurred between 20 and 50 years. It is more common in males.

The ætiology of the acute leukæmias is entirely unknown. They have a rapid course with fever; the average duration is about ten weeks, and they are always fatal.

The diagnosis of leukæmia rests upon the predominance and persistence of certain types of leucocyte in the blood stream.

Eleven post-mortem examinations have been held in cases of monocytic leukæmia. Intense proliferation and infiltration of the splenic structure by large mononuclear cells were noted. The splenic pulp contained large cells, showing pseudopodia, and having the staining reactions of the histiocyte. The sinusoids of the liver, bone-marrow, and lymph nodes were also infiltrated by these cells. The reticulo-endothelial system in the spleen, lymph nodes, and liver showed marked hyperplasia, and the bone-marrow showed a monocytoid metaplasia.

Maximow (1927),[3] a pronounced unitarian, admitted that the monocyte was unique in the circulation of postnatal life. Histologically and culturally the monocyte resembles the histiocyte, and Maximow concluded that monocytes were formed directly from histiocytes in the spleen, liver, bone-marrow, and lymph glands. The polyphyletic view, that the potentiality of the cells of the three blood-forming tissues—the myeloid, the lymphatic, and the reticulo-endothelial—in postnatal life does not change, and that these three systems produce the myeloid cells, the lymphocytes, and the monocytes of the blood stream respectively, is generally accepted. There seems no reason, then, to deny the possibility, or even the certainty, of there being a reticulo-endotheliosis which gives rise to the third type of acute leukæmia comparable in every respect to the acute myeloid and the acute lymphatic.

[3] Maximow, A.: Ann. d'anat. path., 1927, iv., 701

A CASE OF GONOCOCCAL PYONEPHROSIS.

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The patient, a married woman aged 31, with two children aged 10 and 9 respectively, attended the out-patient department of St. George's Hospital on Feb. 10th, 1930, complaining of slight irritation on micturition, and the passage of small amounts of blood at the end of the act. These symptoms had been present for a week, and there had been no previous trouble. There was no frequency or pain, and no vaginal discharge. When she was examined in the gynæcological department no abnormality was found, and she was referred to the genito-urinary department, where cystoscopy was performed on Feb. 13th. Nothing abnormal was observed, except slight urethral pain on introducing and removing the instrument, the latter manœuvre being followed by slight bleeding. A catheter specimen of urine contained many pus cells and many red blood corpuscles, but no casts or crystals and no tubercle bacilli or other organisms. Cultures were sterile.

A diagnosis of mild urethritis was made and further investigations proposed. The patient, however, disappeared, next reporting at medical out-patients on Feb. 18th, with pain and swelling of the left elbow. This had arisen suddenly, without trauma, two days before, and was severe. No hæmaturia or irritation had been noticed since the cystoscopy. As she was ill, with a temperature of 101°, she was immediately admitted to the hospital. Her husband then volunteered the information that he had been suffering from gonorrhœa for six weeks.

She was a rather thin, sallow woman, with a furred tongue. There was a red, hot, and exquisitely tender swelling of the left elbow, which was held flexed at a right angle. No movement was allowed on account of pain. As far as could be made out, the swelling was mainly periarticular. Pain was complained of in the left leg below the knee, but no abnormality was found in this region. No other lesion was discovered.

With rest the inflammation of the joint quickly subsided, but in spite of this, on Feb. 20th, the second day after admission, there was a rigor, and the temperature rose to 102·6°. On Feb. 22nd a vaginal examination disclosed no sign of infection. Swabs were taken from the cervix and urethra. These showed no organisms on direct smears, but on culture staphylococci were grown from the cervix; and gonococci and staphylococci from the urethra. On Feb. 24th there was another rigor, and the temperature was 104°. Blood culture was negative and the heart and other organs appeared to be normal. The pain and swelling of the elbow had by this time completely subsided. The temperature remained high and the general condition serious until on Feb. 28th a swelling was noticed in the left hypochondrium. At first indefinite in outline, it was considered possibly to be spleen, but it grew rapidly larger, filling the left loin and becoming obviously renal.

On March 6th a general anæsthetic was given and cystoscopy performed, with intravenous indigocarmine. A strong blue efflux was seen from the right ureter in a few minutes, but only thick pus issued from the left. The left kidney was then explored through the loin and found to be very greatly enlarged and fixed. Incision through the thinned cortex opened a pyonephrotic cavity containing about a pint of thin yellow pus. A swab of this was taken and a drainage-tube was sewn into the kidney. The condition of the patient precluded nephrectomy or indeed exploration of the renal pelvis. From the swab a pure culture of gonococci was grown.

The temperature dropped to normal immediately after the operation, but rose again two days later to about 102°, and remained above normal for about three weeks. During this period blood culture was sterile. On March 25th a catheter specimen of urine contained pus cells and a few Gram-negative intracellular diplococci. Fifteen doses of autogenous gonococcal vaccines were administered, every four or five days, increasing from 1 to 60 millions per dose. By April 9th she was sufficiently recovered to be removed to the convalescent home, although the sinus in the loin still discharged pus fairly profusely. No urine ever escaped from this sinus. The course of vaccines was continued, and she left the convalescent home on June 4th in excellent health, the sinus having been firmly healed for a week.

A week later she came to the out-patient department to be X rayed. The sinus had broken down again that day and was discharging pus, and there was an indefinite mass in the left loin, which was not tender. The left elbow-joint was normal, with full movements. X rays showed a large branched calculus plugging the pelvis of the kidney and several smaller outlying stones.

She was readmitted in August, 1930, and the left kidney again explored through the loin. It was found to be enlarged and very densely adherent. On incising the thin fibrous and avascular cortex, a few drachms of pus were found in the pelvic cavity. Intravenous indigocarmine had been injected at the start of the operation but no trace of it was present in the pelvis. The main calculus and several smaller ones were removed and the renal pelvis drained with a rubber tube. Discharge of pus steadily diminished for three weeks, then ceased, and has not since recurred. The urine at this time contained a few pus cells, but was sterile on culture.

Now (June, 1931) it contains no abnormal cells or organisms. The kidney shadow is seen in an X ray photograph to have shrunk in size, and the few calculi left behind in the fibrous shell have not increased in size or number. The patient

works hard and is in perfect health, without symptoms of any kind.

The case is interesting because of (1) the gonococcal pyonephrosis; (2) the severity of the metastatic infection with slight and transient primary gonococcal lesion.

Gonococcal infections of the kidney are very rare. Although pyelitis is a fairly common complication of gonorrhœa, it is nearly always due to infection with other organisms of which the *Bacillus coli* is the commonest. In 1922 Simmons [1] found only 24 proven cases of gonococcal infection of the kidney in the literature, and of these only 15 were unmixed. In the other nine the associated organism was most often the *B. coli*. The onset varied from ten days to nine years after the original infection. Simmons described a case of his own in which a gonococcal pyonephrosis was found in a kidney which was ruptured by trauma. The original urethral infection was six months previous to the trauma, and there was evidence that the renal infection had been present for some time. He concluded that the infections were hæmatogenous, and that gonococci readily passed from the blood through the normal kidney without causing disease, but that if the kidney were already damaged, a gonococcal lesion might be produced. Support for this is given by Lavenant,[2] who in 1930 removed a kidney which was the seat of pyonephrosis. There was a mixed infection of staphylococci, *B. coli*, and gonococci; from the presence of a yellow abscess in the cortex, the route of infection was considered to be hæmatogenous. The condition had arisen after trauma, and had probably supervened on a hydronephrosis.

Similarly, le Fur [3] in 1904 found a gonococcal infection in a kidney previously the seat of closed aseptic hydronephrosis. There were no gonococci in the urine, nor was any cystitis present.

In the case reported here, although blood cultures were sterile, there is strong presumptive evidence of a gonococcal septicæmia, from the general condition of the patient and from the acute arthritis. That the kidney was previously damaged is probable in view of the rapid formation of an enormous pyonephrosis. It is unfortunate that no radiograms were taken at the onset, but the presence of large and dense calculi three months later argues their existence prior to the gonococcal infection. It is probable that a symptomless calculous hydronephrosis was complicated by the excretion of gonococci from the blood stream.

TOXIC EFFECTS OF INTRAVENOUS SALYRGAN.

By C. T. Andrews, M.D. Belf.,
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The use of a complicated organic mercury compound in the treatment of heart failure dates from the introduction of novasurol as a diuretic by Saxl [1] in 1920. Some degree of mercurialism has been found to follow the use of this drug in 20 to 30 per cent. of cases, and novasurol as a diuretic has now been largely superseded by salyrgan, the use of which was first recorded by Bernheim [2] and Brunn [3] in 1924. Salyrgan is a white flocculent powder containing about 36 per cent. of mercury in combination with sodium-salicyl-allyl-amido-acetate. It is put up for injection in a 10 per cent. solution, and is given intramuscularly or intravenously in doses of ½ c.cm. to 2 c.cm. at about three-day intervals. It is usual to give ammonium chloride, in doses of grs. 20 to 30, thrice daily, at the same time.

The results so far recorded have been encouraging. Diuresis usually begins immediately after the first injection, and the total urinary secretion may rise to 100 oz. in the 24 hours. In a search of the literature I have not found any record of severe toxic symptoms following the use of this drug. Bedford [4] records 27 cases treated by salyrgan without toxic symptoms; Bernheim,[2] in 1000 injections, has not observed even slight toxic effects; other observers—Baker and O'Hare,[5] Brunn,[3] Herszky,[6] and Agnew [7]—have recorded similar results.

NOTES OF A CASE.

I have used the drug in nine cases of congestive heart disease. In eight of these a varying degree of diuresis was established. In one, toxic symptoms of such severity were produced that I have ventured to record the case.

A female patient, aged 22, was admitted to Hackney Hospital complaining of cough, shortness of breath, and swelling of the feet and legs of 12 months' duration. There was a history of rheumatic fever at seven. On examination she was found to be dyspnœic and slightly jaundiced. The heart-rate was 116, but the pulse was regular, and the blood pressure was 120/30. There was considerable cardiac enlargement, the apex-beat being in the sixth space in the anterior axillary line, and the right border 2 inches from the sternum. Double mitral disease and aortic reflux were found to be present. There were well-marked signs of pulmonary congestion. The liver was enlarged, the anterior edge being 3 inches below the costal margin. There was a moderate degree of ascites, well-marked œdema of feet and legs, and slight albuminuria.

Under digitalis therapy—℥ iv. of the tincture in the first 24 hours, later reduced to ℥ xv. t.d.s.—the pulse-rate fell to 70 in three days, but after a week's further treatment with digitalis and saline diuretics, combined with restricted fluid and salt intake, the œdema had only slightly diminished.

Treatment with salyrgan was then begun. The technique used was that described by Bedford [4]; the dose was ½ c.cm. diluted to 10 c.cm. with sterile distilled water, and given into a vein at the bend of the elbow. The time taken for the injection was about four minutes. Before the full dose had been given the patient complained of headache. Fifteen minutes later she suddenly lost conciousness, and the upper limbs and face became involved in a clonic spasm of about 30 seconds' duration. The features became blanched during the seizure, the pulse became rapid and almost imperceptible, and the heart sounds during the attack were almost inaudible. The clonic spasm was followed by vomiting, which was repeated several times in the next hour.

In the 12 hours following the injection the patient had five similar seizures. Pallor was a marked feature of each; there was temporary loss of consciousness and each attack was followed by vomiting. No diuresis followed the injection; whereas the average daily output of urine for the four days preceding the injection was 33 oz., the average for the four days following was 24 oz. The blood-urea on the day following the seizures was 37 mg. per 100 c.cm. A urea-concentration test gave normal findings.

DISCUSSION.

I can state definitely that there is no possibility of an error having been made in the dilution of the salyrgan solution. The possibility of coincident uræmic manifestations is also definitely excluded by the blood-urea and the urea-concentration test. The marked tachycardia and pallor suggest a

[1] Simmons, R. R.: Jour. Urol., 1922, vii., 113.
[2] Lavenant, M. A.: Soc. des Chir., Paris, 1930, xxii., 406.
[3] le Fur, R.: Loc. cit.

vaso-motor origin for the symptoms here described, and Jackson [8] has brought forward experimental evidence to show that the action of salyrgan extends to most, if not all, of the vascular structures of the body. We must assume that this patient possessed a marked degree of susceptibility to the drug, because the dose employed was much smaller than the average dose in general use. Possibly it would be advisable to test the susceptibility of the patient with a smaller dose than the ½ c.cm. generally employed. I now give three preliminary injections of ¼, 1, and 2 c.cm. intramuscularly at three-day intervals, and then continue with 2 c.cm. intravenously if no reaction follows.

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MEDICAL SOCIETIES

ASSOCIATION OF AMERICAN PHYSICIANS.

THE forty-sixth annual meeting of this association was held at Atlantic City on May 5th and 6th under the presidency of Dr. RUFUS COLE (New York). One of the discussions was devoted to diseases of the blood.

Monocytic Leukæmia.

Dr. P. W. CLOUGH (Baltimore) read a paper in which he said that monocytic leukæmia, although rare, had excited interest because its demonstration would support the independent status of the monocytes. He had found reports of 16 cases which conformed to the criteria, and he now brought forward an additional case.* They had clinically resembled acute leukæmia of other types, and had been characterised by a marked relative and absolute increase in the number of monocytes in the circulation. In his own case, as in most of the others, there were many immature cells ("monoblasts"). The cells showed the finely reticulated nuclear structure typical of monocytes, a greyish-blue cytoplasm, and reddish-lilac granules which did not take an oxidase stain. Relatively large numbers of the cells showed phagocytic activity in stained films. At autopsy there was a very widespread leukæmic infiltration of the tissues with reticulum cells that exactly resembled the monocytes in the blood. This was particularly marked in the connective tissue around the vessels. There were also changes in the endothelium of the vascular spaces of the spleen, which had been regarded by some as evidence of hyperplasia and desquamation of these cells and of their development into monocytes. In many of the collected cases, said Dr. Clough, there had been some associated myelocytic hyperplasia—a finding which had led some hæmatologists to regard monocytic leukæmia as merely a variant of myeloid leukæmia. It seemed more reasonable to accept it as a distinct system disease, in which, however, there was often some associated disturbance and perverted activity of other parts of the hæmopoietic system.

Dr. G. R. MINOT (Boston) said: "We had about 12 cases of monocytic anæmia, and about four of them showed very definite symptoms of acute arthritis after the leukæmia developed." He asked if Dr. Clough's case or others recorded showed any arthritic manifestations.—Dr. CLOUGH replied that he did not think anything of the kind was noted.

* A further case reported by Dr. W. E. Cooke will be found on p. 129.—ED. L.

AGRANULOCYTOSIS.

Dr. G. M. PIERSOL and Dr. R. STEINFOLD (Philadelphia) said that a classification of granulopenias was proposed as follows:—(*a*) *primary*: (1) acute (Schultz), and (2) chronic or recurrent. (*b*) *secondary*, due to general and focal infections, chemical causes, irradiation, and blood diseases. The occurrence of benign types, particularly those due to focal infections, was exemplified by several case reports. The mechanism of granulopenia had been studied experimentally in rabbits, by the inoculation of various bacteria which had been from time to time found in conjunction with the condition. The effect of altered states of reactivity had been considered, based on their resemblance to those cases associated with focal infection. Hyperergy and the Schwartzman phenomenon particularly were studied.

Dr. A. E. TAUSSIG (St. Louis) said that the number of cases of agranulocytosis now reported justified a first attempt to estimate the value of the various methods of treatment. Three methods only were of importance—namely, intravenous injections of small doses of neoarsphenamine, blood transfusion, and irradiation of the long bones with the X ray. An analysis of 340 cases showed a total mortality of 79 per cent. For the purpose of evaluating therapeutic procedures the cases which proved fatal within 48 hours of beginning treatment were discarded. This left 80 patients treated by means of irradiation of the long bones, with a mortality of 53 per cent.; 49 patients treated by means of transfusion, with a mortality of 69 per cent.; 31 who received neoarsphenamine, with a mortality of 77 per cent.; while of 172 patients who received other methods of treatment, 75 per cent. died. It seemed then that only irradiation and transfusion promised even reasonably satisfactory results. It would probably be wise to use both methods in the treatment of a severe case, and doubtless the results would be better the earlier the methods were applied. During the past 12 months, said Dr. Taussig, seven cases of agranulocytosis had been seen at the Jewish Hospital of St. Louis. Of these, two were moribund when admitted, and died the same day; a third received only symptomatic treatment, and also died. The remaining four were given stimulating doses of X rays over the long bones. Of these, two recovered, responding rapidly to the treatment and were discharged clinically well. The other two also responded promptly and satisfactorily to X ray treatment, the blood picture becoming normal, the fever and angina subsiding. After an interval of well-being, however, both cases relapsed, and in this relapse were refractory to X rays. Both died in coma.

In reply to a question, Dr. Taussig said that the object of treatment was to get an effect on the bone-

marrow. The maximal amount of marrow, with the minimal amount of tissue over it, was in the long bones.

Hæmoglobin-production and the Liver.

Dr. G. H. WHIPPLE (Rochester, N.Y.) pointed out that hæmoglobin regeneration in experimental anæmia had received much attention during the last few years. The experiments of Robbins and Whipple were concerned with a simple anæmia due to withdrawal of blood.

This experimental anæmia in dogs was maintained at a given level—40–80 per cent. hæmoglobin or one-third of the normal hæmoglobin level. New hæmoglobin produced above this level was withdrawn and measured, thus keeping the anæmia level constant and evaluating the potency of any given diet for the production of hæmoglobin under these conditions. These dogs had been kept anæmic for years—in some cases seven years—and were in a state of perfect health and activity. The reaction to fixed diets was very constant, and repeated experiments in the early or late years of the anæmic period would show a similar hæmoglobin output. "With this base-line control for anæmic dogs," said Dr. Whipple, "we may record interesting differences in Eck fistula dogs, one continuously anæmic for six years." The Eck fistula dog was below the average normal for hæmoglobin production on various standard diet intakes. As was well known, when it was poisoned by chloroform, the liver was injured and the normal repair of this central necrosis might be very greatly delayed. Under certain conditions, therefore, the Eck fistula liver might approach a physiological insufficiency. Under favourable conditions, following chloroform poisoning of an Eck fistula dog, it had been observed that the output of hæmoglobin on standard diet intake might fall to a level about half that of the Eck fistula before the chloroform poisoning. In one case this condition was followed after eight months by a return of liver function to normal and a normal hæmoglobin output. This suggested that the liver takes an important part in hæmoglobin production. The liver perhaps helped in the grouping of amino-acids essential to the formation of parent pigment substances which were utilised by the bone-marrow to produce finished red cells. This observation was in harmony with the well-known fact that liver feeding enabled an animal or human to produce large amounts of new blood-cells. This helped to supply a logical explanation for success of liver diet in anæmia.

The Active Substance in Liver.

Dr. W. W. PALMER and Dr. R. WEST (New York) communicated a note in which "barium salts of acids derived from liver, highly active in pernicious anæmia," were described. From these, they said, a quinine salt had been isolated, and on hydrolysis, β-hydroxy-glutamic acid and γ-hydroxyproline had been identified. More recently Dakin had isolated the quinine salt of a tribasic acid from liver, which contained the pyrrolidine ring, and had a higher melting-point and quinine content than those of acids previously reported. Injections of 700 mg. of this acid had given in two instances modest reticulocyte rises, up to 15 and 20 per cent., with red blood-cells at about one million. A crystalline substance had also been isolated from the regenerated barium salts, which was highly potent clinically.

Microcytic Anæmia in Middle-aged Women.

Dr. DOUGLAS VANDERHOOF (Richmond, Va.) reported five cases presenting a type of anæmia and certain clinical features suggesting a disease entity. The patients were all women, the youngest aged 37, and the oldest 46. The anæmia was chronic, having lasted from 11 years to 15 years in four cases, and at least two years in the other. There had been no remissions nor any symptoms or signs suggesting degeneration in the spinal cord. Four of the women showed the typical tongue of atrophic glossitis. Fractional gastric analysis showed achlorhydria in four cases, with no response after the hypodermic injection of 0·5 mg. histamine in three, while one patient showed a slight secretion of free hydrochloric acid after the histamine. In the fifth cases achlorhydria was strongly suspected, but the patient refused gastric analysis. All suffered from weakness, palpitation, and breathlessness, and four complained of digestive disturbances. Three listed diarrhœa of the morning type as a prominent symptom. All had menstrual irregularities with menorrhagia.

When these women first came under observation, the hæmoglobin ranged from 40 to 58 per cent. in four, with red cell counts from 3,200,000 to 3,900,000. In the fifth patient the hæmoglobin was 65 per cent. and the red count 4,200,000. All showed a low colour-index. The striking feature of the blood picture, however, was the small size of the red blood-cells. Their mean diameter was under seven microns in every case, ranging from 6·32 microns as a minimum, to 6·96 microns as a maximum. This blood picture, said Dr. Vanderhoof, might properly be classified as microcytic. It was of the hypochromic or chlorotic type, but the total red cell count tended to be lower than in true chlorosis, and the atrophic glossitis and gastric anacidity were distinguishing features in the cases reported. Treatment consisted of large doses of iron and adequate hydrochloric acid therapy. Instead of the iron an aqueous liver extract could be used with good results. The anæmia gradually recurred when treatment was omitted.

Dr. W. S. THAYER (Baltimore) pointed out that in severe chlorosis the blood count was usually reduced. In 1890–91 he had followed carefully 60 to 70 cases of chlorosis throughout their course. There was almost always considerable oligocythæmia, but the oligochromæmia was always relatively more marked. He thought that a normal red cell count with a very low hæmoglobin percentage was rare.

Iron in Anæmia.

Dr. G. R. MINOT and Dr. C. W. HEATH (Boston) gave a paper on the Response of the Reticulocytes to Iron, and Some Aspects of Iron Therapy. In pernicious anæmia without serious complications, treated with maximal amounts of liver or potent substitutes, the height of the reticulocyte rise, said Dr. Minot, was inversely proportional to the level of the red blood-cells and hæmoglobin before treatment. Similar, but less exact, relationships existed in anæmias responding to iron. Infections and other complications might hinder the action of iron, just as they hindered the action of potent material in pernicious anæmia. Distinct rises of reticulocytes occurred in response to iron with relatively high red blood-cell levels, at which in pernicious anæmia insignificant increases took place. With low hæmoglobin values the reticulocytes, in response to adequate treatment, increased much more in pernicious anæmia than in secondary anæmia. Both the hæmoglobin and red blood-cell level must be considered in evaluating the reticulocyte response to iron. For a given red blood-cell level the reticulocyte response to maximal

doses of iron would be greater the lower the hæmoglobin, and the response for a given hæmoglobin level the lower the red cell count. Although in pernicious anæmia the distinctions were not so great, there was a tendency for the reticulocyte response at any given red blood-cell level or hæmoglobin level to be slightly greater in direct proportion to the colour-index. The exact type of case should also be considered in evaluating the reticulocyte response to iron. In cases with similar red blood-cell and hæmoglobin levels there was a tendency for those with achlorhydria to have reticulocyte responses to iron of less magnitude than cases with free hydrochloric acid in their gastric contents. There was, in general, a direct relationship between the height of the reticulocyte rise and increase of hæmoglobin; at least when before iron is given the hæmoglobin is less than 40 per cent.

REVIEWS AND NOTICES OF BOOKS

Modern Surgery.

Tenth edition. By JOHN CHALMERS DA COSTA, M.D., LL.D., F.A.C.S. Assisted by BENJAMIN LIPSCHUTZ, M.D., F.A.C.S. London: W. B. Saunders Company. 1931. Pp. 1050. 45*s*.

THIS is the tenth edition of a work which has long established its worth. The great advantage of a text-book written by a single author resides in its uniformity of outlook. Although the assistance of Dr. Benjamin Lipschutz has been enlisted, the essential nature of Dr. Da Costa's book has been preserved. The two authors set themselves the task of true revision—that is, the inclusion of such of the new work as is worthy, the rejection of such of the old work as has proved faulty in conception and wanting in practice. They have avoided undue submission to fashion, while at the same time escaping from the trammels of ingrained habit and tradition. There is breadth of view and surgical judgment apparent in the teaching on almost any subject about which the reader may desire information. Modern ways of tackling old problems, such as Orr's method for osteomyelitis, or the Henderson operation for recurrent dislocation of the shoulder, are described and assessed, and the value of the descriptions is enhanced by the references to original sources of information. The practical nature of the work is exemplified by the discussion on injuries to tendons. Throughout the reader is encouraged to refer to recent work. This confidence in the judgment of the authors is likely to be consolidated by the candour and modesty of their remarks upon the operative treatment of exophthalmic goitre. This is a very good text-book of surgery, indeed a scholarly book, which could only have been written by men of culture, discernment, and experience.

Abdominal Pain.

By JOHN MORLEY, Ch.M., F.R.C.S., Assistant Surgeon, Manchester Royal Infirmary; Surgeon, St. Mary's Hospitals, Manchester. Edinburgh: E. and S. Livingstone. 1931. Pp. 191. 10*s*. 6*d*.

IN this book Mr. Morley attempts to give an explanation of the mechanism of distal and local pain in abdominal disease. His clinical observations have convinced him that Mackenzie's views are incorrect—i.e., that viscero-motor and viscero-cutaneous reflexes do not exist. He postulates a peritoneo-cutaneous radiation of pain and a peritoneo-motor reflex. There are numerous interesting clinical observations brought forward to support the hypothesis. Though the book is a very stimulating one to read it does not convince beyond doubt. There is definite experimental evidence of a viscero-motor reflex, and it is a little difficult to believe that in renal colic there is no such thing as a viscero-cutaneous radiation of pain. The whole subject is excessively difficult to elucidate, and we agree with the author that much investigation must necessarily be clinical in nature. The careful observations recorded here are a definite contribution to knowledge and provide an incentive to further study which will no doubt help to clear up this obscure branch of human physiology.

Clinical Examination and Surgical Diagnosis.

By FELIX LEJARS, Professeur de Clinique Chirurgicale à la Faculté de Médecine de Paris; Chirurgien de l'Hôpital St. Antoine. Translated by HELEN C. SCOTT, M.R.C.S., L.R.C.P. London: Jonathan Cape. 1931. Pp. 872. 50*s*.

Chirurgische Diagnostik.

By A. J. CEMAK. Vienna: J. F. Lehmanns. 1931. R.M.18.

Prof. Lejars's book in its French form is familiar to many surgeons. It has been most ably translated by Dr. Helen Scott, who has succeeded in conveying the meaning of the author and retaining the charm of his style. There is no other book quite like it in English. The student is taught the technical details of how to examine each region of the body as clearly as it is possible to teach him by the written word with the aid of pictures. The meaning of signs elicited is then discussed and the bearing of such findings upon the diagnosis. The whole plan of the book has been carried out extremely well, and no student can fail to learn much from reading it. His interest will be retained throughout. Though the illustrations, which reach the astonishing number of nearly 1100, serve their purpose in demonstrating the points that the author wishes to make, they have suffered in the reproduction, perhaps because the paper is not quite suitable or perhaps because so many impressions have already been taken from the original blocks.

"Chirurgische Diagnostik" is a new enlarged edition of a well-known atlas of surgical diagnosis. The chief change in it, beyond an increased number of illustrations, is the addition of many more tables of diagnosis, which are most useful for reference, though rather unsuitable for elementary students who are learning their work for the first time. Some coloured pictures appear in this edition which were absent from the former. The reproductions leave nothing to be desired in quality and there are 568 of them. Good as former editions were, this is better; it is more complete.

Calcium Metabolism and Calcium Therapy.

By ABRAHAM CANTAROW, M.D., Assistant Demonstrator of Medicine in the Jefferson Medical College, Philadelphia. Philadelphia: Lea and Febiger. 1931. Pp. 215. $3.75.

Lord Kelvin used to say that it is only when we learn to measure a thing that we really begin to know anything about it. Since it became possible to

estimate accurately the blood calcium, we have begun to learn something of the mechanism of the calcium exchange in the body. Dr. Cantarow points out how progress in the knowledge of this subject has been made by investigators in physiology, chemistry, pharmacology, medicine, and experimental pathology. He makes it quite clear, however, that in spite of our increasing recognition of the importance of calcium in the economy of animals and plants, our knowledge of the physico-chemical regulations of inorganic salt metabolism is somewhat crude. The complexity of the mechanism of regulation of calcium metabolism renders the bulk of the literature on this subject incomprehensible to clinicians who have not been specially concerned with the subject.

Dr. Cantarow divides his book into three parts: normal calcium metabolism, abnormal calcium metabolism, and calcium therapy. In Part I. he deals with calcium absorption and excretion and the blood calcium. The factors involved in the maintenance of the normal serum calcium level are discussed in a separate chapter. He goes with considerable detail into the functions of calcium in the body. In this section he includes bone formation, membrane permeability, cardiac action, coagulation of blood and milk, nerve and muscle excitability, capillary permeability, acid base equilibrium, and water balance. In Part II. disorders of calcium metabolism are set out in detail. Rickets being too big a subject to discuss fully, Dr. Cantarow concerns himself very little with morbid anatomy, but he recognises that biochemical investigations have served to emphasise the truth of the original claims of Pommer and Schmorl as to the essential identity of rickets and osteomalacia. Hypoparathyroidism is discussed, and hyperparathyroidism is described in detail, though no space has been found for outlining the morbid anatomy and histology of generalised osteitis fibrosa. In a chapter on the disturbances of the level of the blood calcium and calcium partition the author describes the conditions under which hypocalcæmia is found, and some of the conditions associated with hypercalcæmia. Gastric tetany, phosphate tetany, and the tetany associated with hyperpnœa and with excessive dosage of bicarbonate are clearly set out. In Part III. the use of calcium salts by oral, subcutaneous, intramuscular, and intravenous administration is related in detail. The effects of the parathyroid hormone, of vitamin D, and of ammonium chloride on calcium metabolism are all described. Then follow a chapter on the treatment of tetany, and a last chapter on non-specific calcium therapy. The treatment of rickets and osteomalacia is not considered.

The book is well and concisely written, and almost entirely free from misprints. An excellent bibliography is appended. The author has succeeded in placing in an accurate and readily available form the whole of the useful knowledge on a new and important subject.

The Slum: Its Story and Solution.

By HARRY BARNES, F.R.I.B.A., F.S.I. London: P. S. King and Son, Limited. 1931. Pp. 398. 18s.

Major Barnes knows a great deal about housing, both historically and as a contemporary problem. In this book he traces the three main channels along which legislative effort has flowed: the building Acts, deriving from Lord Shaftesbury; the reconditioning Acts, of which Torrens was the pioneer; and the Acts for slum clearance, whose first parent was Sir Richard Cross. Major Barnes gives impressionistic sketches of these and other champions of housing reform. He also supplies some interesting examples of time-lag; he tells us, for instance, that Joseph Chamberlain suggested in 1885 the "willing seller and willing buyer" formula for compulsory purchase, which was at last incorporated in the Acquisition of Land Act of 1919. With regard to present-day housing efforts, Major Barnes argues that we are not likely to make satisfactory progress so long as initiative is left to a large number of local authorities. He wants to see housing commissioners working on a large scale all over the country. It is a plea worth careful consideration. Major Barnes also thinks that in London and other great cities there is no practicable alternative to rehousing in high buildings. Not sufficient is said about the reconditioning of houses, of which a great deal more might be done with advantage at the present time. And the author's treatment of the pig-and-sty question is quite inadequate. Major Barnes does, however, advocate management by skilled women workers on the Octavia Hill system. The book would have been better if the author had cut out a number of rhetorical and jocose passages.

Radiologische Praktika.

Vol. XVII. *Röntgendiagnostik der Gallenblase.* By Priv.-Doz. Dr. F. EISLER und Dr. G. KOPSTEIN. Leipzig: Georg Thieme. 1931. Pp. 153. M.18.60.

THIS volume, one of a series intended to cover the whole field of practical radiology, furnishes a very complete review of the examination of the gall-bladder by means of X rays. The authors trace first the history of this method of showing gall-stones, starting from Baxhaum's paper in 1898. A concise account of the anatomy and physiology of the biliary tract follows. In the main section on cholecystography the intravenous, oral, rectal, and intraduodenal methods of introducing the dye are carefully described, and the advantages and disadvantages of each method discussed. The authors themselves prefer the oral method and describe their own technique fully, giving due weight to that followed by other workers. The discussion of interpretation of results is full and clear. Special stress is laid on errors which may arise from variations in the shadow cast by a normal gall-bladder. Faulty projection may produce apparent variations in shape and can only be overcome by great care. The same cause is responsible for some cases where the gall-bladder is described as not filling, and where adhesions are diagnosed. To get the best results the patient must be rotated and films must be taken from different aspects and in different positions; sometimes an opaque meal must be taken before examination if clear-cut results are to be obtained. In our experience this precaution is especially desirable when the mobility of the gall-bladder is in question, since the excursion shown in relation to neighbouring viscera in different postures of the patient is the most reliable evidence of mobility. Hour-glass gall-bladder is fully discussed in all its aspects in this work, with particular reference to its pathological significance. To test the contractility of the gall-bladder the administration of egg yolk is advised, and the authors regard this as an essential part of every cholecystography; we ourselves find that toast with three or four pats of butter is as efficacious and more palatable to most patients. The egg yolk has the advantage, however, that it is more easily included in an opaque meal, if this is found necessary. The authors set out the evidence clearly and dispassionately, and while upholding their own

views, do so very fairly and with consideration for those who differ from them. The book is well printed and the illustrations are numerous and well reproduced. The otherwise excellent bibliography is marred by the omission to link up authors named in the text with the corresponding papers quoted in the bibliography. The authors deserve congratulation on a comprehensive and useful monograph.

The Treatment of Behavior Disorders following Encephalitis.

An Experiment in Re-education. By EARL D. BOND, M.D., and KENNETH E. APPEL, M.D. New York: Commonwealth Fund Division of Publications. 1931. Pp. 163. $1.75.

SINCE 1919, when epidemic encephalitis became prominent, it has presented a problem which has perplexed all who have had to attempt to solve it. Teachers, judges, and probation officers, and those in charge of children's institutions, as well as parents, have been mystified when children after this disease suddenly became serious delinquents. The best efforts to handle the problem have been generally unsuccessful.

This book concerns a significant experiment in giving study and treatment to 62 children whose behaviour disorders were the direct result of encephalitis or resembled the effects of that disease. Gathered from homes and institutions where treatment in an adult environment had signally failed, these 62 children became members of a group under the observation and care of the Department for Mental and Nervous Diseases at the Pennsylvania Hospital. In this department the personality of each child is intensively studied; and, guided by the results of the study, attempts are made to develop in the children more wholesome attitudes to their illness and their environment, and to turn their unadaptive apache tendencies into useful, constructive behaviour. Nothing novel in the way of treatment is described. The necessity of having a long-distance plan is stressed, and this plan must be kept in view by all personnel dealing with the child. Such personnel includes psychiatrists, specially trained teachers, nurses, occupational therapists, and social workers. Probably the only criticism that can be offered against this most praiseworthy experiment is on the grounds of expense. Certainly in this country no local authority is likely to consider seriously "a graded school and playgrounds under psychiatric supervision, with a personnel including specially trained teachers, nurses, and occupational therapists" attached to "a hospital for mental diseases with a special building for children in its own grounds." But the methods employed, and the results obtained with this group of "apache" children, should be of considerable help to all concerned with children presenting conduct disorders after encephalitis; and they also throw light upon the treatment of other children whose behaviour is antisocial and perplexing.

A Manual of the Common Contagious Diseases.

By PHILIP MOEN STIMSON, A.B., M.D., Associate in Pediatrics, Cornell University Medical College; Attending Physician, Willard Parker Hospital. Philadelphia: Lea and Febiger. 1931. Pp. 351. $3.75.

THIS book has been prepared for the guidance of medical students, internes, and nurses, whilst the hope is expressed that it will be also of value to general practitioners, pædiatricians, and school physicians. It includes chapters on such subjects as the principles of contagion, serum reactions, and general management of contagious diseases, as well as on all the common infectious diseases except small-pox, the diagnosis of which is, however, dealt with under the differential diagnosis of chicken-pox. In connexion with each disease the rules for the quarantine of school and other contacts are detailed and specific methods of prophylaxis are described. With such a wide field to cover the author has been unable to maintain the balance of his book, and whilst in the chapter dealing with diphtheria such pareses as those of the oculo-motor muscles and the pharyngeal muscles are not mentioned, in the chapter on measles he has thought it necessary to devote two and a half pages to a discussion on the conflicting claims of Tunnicliff, Caronia and Sindoni, and Degkwitz for recognition of the ætiological significance of the various agents they describe. Some useful information may be derived from the sections dealing with the control of contacts of infectious diseases in schools, but since practice in this country seems to differ in several important details from that in the U.S.A., the value of these sections to British readers is somewhat impaired. The chapter on the general management of contagious diseases is concerned mainly with what is designated "medical aseptic technic," and is based on the ritual observed in the Willard Parker Hospital. The "Gown Technic" seems a miracle of completeness and must impose a continuous strain on the aseptic conscience of the nursing staff. Probably a simpler technique combined with attention to such factors as floor space and ventilation would absolve the author from recommending that "measles should be segregated at least on a separate floor, but preferably also in a separate building." Those with experience of chamber isolation wards in this country have had abundant proof that the spread of such diseases as chicken-pox and measles is amenable to that method of isolation. The two chapters on epidemic meningitis and poliomyelitis, in which the author has had the assistance of Dr. Josephine Neal, are the best part of the book. At the end of each chapter is a bibliography, in which we can find references to very little work published outside the United States. The general appearance and printing of the book is excellent, but the various points noted above, together with the fact that the phraseology is liberally interlarded with American idiom, are likely to prevent this work from becoming a serious rival to those already established in this country.

Indian Journal of Medical Research.

IN the April issue (Vol. XVIII., No. 4) R. N. Chopra and V. Iswariah contribute an article on their experimental investigation into the action of the venom of the Indian cobra. S. R. Christophers and I. M. Puri report on the results of their investigations of anopheline mosquitoes collected in Sierra Leone, while J. A. Sinton continues his series in a paper on the identification of *Phlebotomus purii*. An account of the rat-flea survey of Rangoon Port area, which will be read with interest by port sanitarians in particular and by those interested in plague in general, is given by G. G. Jolly, V. W. Fenn, and R. Dorai. This account contains graphs and tables, and in their conclusions we note that *Rattus rattus* contributes only 8·83 per cent. to the rat population surveyed. The flea index for *Xenopsylla cheopis* is remarkably low at 0·14, while that of *Xenopsylla astia* is 2·59. C. A. Gill and R. B. Lal give a preliminary report on the epidemiology of cholera. Other papers include one by R. McCarrison, on goitre, and one by L. E. Napier on the feeding habits of sandflies.

THE LANCET.

LONDON: SATURDAY, JULY 18, 1931.

HOSPITALS AND TRAFFIC CASUALTIES.

WE lately discussed[1] the disappointing experiences of hospitals under the subsection of the Road Traffic Act which purports to enable them to recoup the cost of treating traffic casualties out of money available under the new system of statutory insurance. The hospitals will be anxiously watching this item in their expenditure, and doubtless their reports will show how far it has been met either by insurance or by the gratitude of patients. It should thus be possible at the end of the year to make a closer estimate of the actual value of the subsection. Meanwhile the British Hospitals Association, it is understood, has in hand a memorandum upon the legal position. Guidance upon the interpretation and application of the existing statutory provision will be the more valuable because it is clear that matters can hardly be left as they now stand.

It is essential that Parliament and the public should bear in mind that the clause in the Road Traffic Act was not a final solution of a grave and increasing difficulty, but a hurried and imperfect improvisation inserted in the Bill without any hearty encouragement from the Ministry of Transport, which naturally had no desire to multiply the elements of controversy. In its original form the clause was an amendment proposed by Lord LUKE, with the support of the many members of the House of Lords who have special concern in the management of hospitals. It briefly proposed to extend the scope of compulsory insurance to cover the payment to a hospital of the cost of treating bodily injuries due to the use of motor vehicles on the road up to a maximum of £25. Lord LUKE explained that in 1927 the cost of such treatment in hospitals had been £230,000, of which only £26,000 had actually been recovered. The cures, as he pointed out, were at the expense of the hospital, and the road casualties were using the beds provided by local effort for local needs. The original clause had to undergo alteration as well as criticism. Lord BERTIE of THAME sought to extend compulsory insurance further to cover payments not only to hospitals but also to surgeons and medical practitioners who had earned remuneration by treating the victims of motoring accidents. This proposal, which, if justice is to be done, cannot be permanently shelved, was withdrawn in order not to jeopardise the very limited concession which the hospitals had hopes of securing. The original clause itself was attacked on legal grounds by Lord ATKIN as a breach of the fundamental principle of insurance; there was, he objected, no contractual relationship between hospital and insurance company. This objection was repeated by the representative of the Ministry when Lord LUKE's amendment reappeared in something like its final form on the Third Reading of the Bill. By that time the late Earl RUSSELL, whose successful conduct of a long and controversial Bill had been a triumph for temper, common sense, and hard work, had undertaken other responsibilities. His successor was inclined to resist the claim of the hospitals as introducing a new principle—as though the whole system of compulsory insurance against third-party risks was not itself a novelty. Later there was fresh discussion when the Bill reached the House of Commons: the Minister wanted to give "no bread" rather than the "half loaf," but the issue was left to a free vote, and the clause managed to hold its ground. It was already realised that the proposal was incomplete and imperfect. Lord CECIL of CHELWOOD had tabulated the threefold grievance of the hospitals. First, there was the fact that accommodation for the locality was in fact being utilised by non-resident motorists. Secondly, even where there was liability to pay for the accident (by reason of the element of negligence), the hospitals could get no payment. Thirdly, there were copious instances of injury treated by hospitals where nobody was liable, because legally or technically the element of negligence was excluded. As Lord CECIL explained, it was only the second of these three troubles which the clause could help; yet it was just as bad for the hospital whether or not there had been negligence in the traffic accident. That observation still holds good.

It may fairly be stated that the whole of the hospitals' difficulty in this matter arises because they have refused to abandon their tradition of the open door. "They can say," remarked the Minister of Transport, "that they will not treat anybody unless they are paid." That is just what the hospitals will not say. At the beginning of the century they still managed to meet local needs from local resources. Even the exceptional and sudden strain of some local catastrophe on the railway or in the coal-mine proved no greater burden than local generosity could bear. To-day the new conditions are obvious—the progressive increase in the number of motor vehicles and traffic accidents, the mobility of the ubiquitous motorist, who may be described as having no domicile, and the consequent delocalisation of responsibility for the local burden. Local resources can do no more; whence then is the money to come? For the making and maintenance of roads for motorists the State has now undertaken large liabilities in relief of local authorities. It might be argued that the cost of traffic casualties is an incidental expenditure to be met in the same fashion; but when Earl RUSSELL asked if the hospitals suggested a flat-rate addition of a shilling on the driving licence there was naturally a reluctance to specify the particular source of revenue to be made available. The insurance companies, having their shareholders to consider, cannot be expected to increase their liability without additional premium. But already they may be called upon to make good the cost

[1] THE LANCET, 1931, i., 1356.

of an insured patient's treatment in a rate-aided hospital or his treatment by a private doctor in a nursing home; the risk that remains to be covered is the cost of treatment in a voluntary hospital. Does actuarial information show this cost to be overwhelming when spread over the companies which so serenely encounter the other contingencies of insurance business in this country? As experience accumulates of the working of the compulsory system under Part II. of the Act the companies will doubtless be better able to state the terms on which such insurance can be made complete. At present, the hospitals can fairly contend, there is unfortunately a gap which must somehow be filled.

LATENT MAXILLARY SINUSITIS.

THE term "latent," as applied to any disease, is a relative one, and depends on the available means of examination and on the thoroughness with which they are employed. In the earlier days of rhinology it was used of any case of sinusitis which did not show the frank symptoms of local pain or unmistakable purulent discharge, even when swelling in the region of the middle meatus or a stream of pus could be discerned on expert examination of the nose. With our wider experience such cases can no longer be considered latent, but it has been recognised of recent years that cases of infection of the antrum and other nasal sinuses exist, and indeed are not uncommon, to which the term "latent" may more properly be applied. The symptomatology in these cases is usually that of some secondary complication such as asthma, migraine, retrobulbar neuritis, or the more distant symptoms of a focal infection. Many of the patients have no nasal discharge, except during exacerbations which are described as colds, and the nares look normal on examination. In some of these the antrum is dark, or relatively dull compared with the opposite side, on transillumination, and in many pus or other secretion can be obtained by tapping and washing out, or aspirating, the sinus. It is doubtful whether even these cases should be called latent, for transillumination and exploratory puncture are in everyday use by the rhinologist. But there is a further group of sinuses with chronically infected hyperplastic mucous membrane, or with polypoid degeneration of the lining, which may transmit light normally and from which the washing fluid may return quite clear. It is true that bacteriological examination will here show a growth of pathogenic organisms, but these cases may in the present state of our knowledge be fairly classed as "latent."

It is here that X ray examination has a special diagnostic value, and this is well brought out by Dr. RALSTON PATERSON in an article which appears on another page. Of 100 cases in which the antrum showed clouding on a routine examination, 46 were washed out and pus was obtained in 30, or 65 per cent.; bacteriological examination might well have disclosed a larger proportion of infection. In six of these purulent cases—i.e., in 13 per cent. of those washed out—the sinusitis was totally unsuspected before radiography and they are therefore classed by him as "absolute cases of latent sinusitis," but it is not stated whether any previous rhinological examination had been carried out. There is still a considerable percentage of error both in radiographic and clinical examination. R. A. KERN and H. P. SCHENK,[1] to whose investigations Dr. PATERSON refers, believed that this error was largely due to the rhinologist's reliance on the return of clear fluid on irrigation as an indication of a normal sinus; and certainly increasing experience shows that this is not an entirely reliable criterion without bacteriological examination of the fluid. As we mentioned nearly two years ago,[2] in commenting on their work, a further source of error is that former inflammation may leave a thickening of the muco-periosteum which gives a clouding both in the skiagram and on transillumination. Neither clinical nor radiographic examination is always reliable, but of the two, radiography is the more sensitive. Radiography, however, picks up evidence of past as well as of present disease; furthermore, it often fails to demonstrate recent acute infection, whereas by clinical examination chronic disease is more likely to be overlooked, especially a low-grade type of infection. Both clinical and radiographic methods should be employed in obscure cases, for a sinus cannot properly be regarded as healthy merely because it transilluminates brightly, or even because a clear fluid is returned on irrigation. With the more thorough and accurate methods of examination now at our disposal, fewer cases of sinusitis need be labelled "latent" because they have eluded diagnosis.

HEALTH IN INDUSTRY.

THE general acceptance of the fact that a healthy, contented worker is as necessary to productive efficiency as is well-designed and lubricated machinery is largely due to the activities of the Industrial Health Research Board, whose eleventh annual report has just appeared.[3] The progress made during the second quinquennium of the Board's existence is summarised. The advances recorded are not the less remarkable because they seem obvious when made and are rapidly becoming common knowledge. The ideal work curve, for example, is now recognised. This curve is that of a record-holding long-distance runner who quickly attains his optimum pace and then maintains it unaltered to the end; yet, but a few years ago the saddle-back shape of hourly output, in particular, and other irregular shapes, were claimed to represent normal physiological processes. The discovery of this law of human efficiency—entirely based on the researches of the Board—is to-day of great value in estimating the influence of various factors upon productivity. The value of such adjuvants to output as rest-pauses or improved

[1] Amer. Jour. Med. Sci., 1929, clxxviii., p. 168.
[2] THE LANCET, 1929, ii., 779.
[3] Eleventh Annual Report of the Industrial Health Research Board to June 30th, 1931. H.M. Stationery Office. 1931. 1s. 6d.

lighting is measured by the extent to which any particular work curve is made to approximate to the ideal shape. No longer is ridicule poured upon the prophecy that by reducing hours of work output may be increased, in proportion to the extent that output depends mainly upon human activity. In fact the dictum now is that, except to meet some emergency, overtime does not pay; while some daily relaxation is appreciated to be advantageous to both health and efficiency. Accidents have been shown not to be inscrutable acts of blind chance, but to be subservient to definite influences, both intrinsic and extrinsic. Persons of nervous instability display a high accident-rate; 25 per cent. of such persons in any group are likely to be associated with 75 per cent. of the accidents. These unbalanced persons also tend to have a high sickness-rate, and to be the least skilled among the workers. Extrinsic factors are also important. Fewest accidents occur at a temperature of 65°–67° F., which is the optimum for output and for least lost time; the accident-rate is also affected by lighting, noise, and external irritations. In fact, the incidence of industrial accidents may be used to measure healthy or unhealthy industrial environment. Here, then, is another discovery—that, given the existence of a hazard, accidents are not "accidents."

All research, however, has not been positive; certain ghosts have been laid. The effect of monotonous repetition work is one; it has often been claimed as a soul-destroying influence of modern mass production. Nowadays it is known that boredom is more intense in semi-automatic operations, which prevent freedom of thought, but are insufficient to keep the mind fully occupied; relief comes from more complete mechanisation, when the mind may wander. Nevertheless, the more intelligent workers prefer occupation which keeps both body and mind fully employed. Another bogy exposed is the harmful influence generally held to be exerted by menstruation on mental and muscular efficiency; the undue stress laid on this influence amounts often to an obsession. Research has failed to provide experimental evidence that the menstrual period in normal women is associated with serious incapacity; it rather indicates that no special strain is laid upon the organism by the performance of physical work at such times, and, since functional activity, as a whole, is lowered, that external work is performed at lower physiological cost. These findings are in accord with the survey reported in this journal last July,[4] which disclosed that certainly more than half a typical batch of schoolgirls have no pain or disability at all at a time when popular tradition pictures their lives as profoundly disturbed; while the association disclosed between active exercise and "no pain" recalls the advice given in the seventeenth century by RAMAZZINI to his fashionable patients who complained of dysmenorrhœa, to follow the customs of working women.

A final example of the negative results recorded by the workers of the Industrial Health Research Board is the refutation of the assertion, often made, that the conditions of so-called humid weaving sheds are less favourable than those of other sheds; here the most careful analysis of invalidity records has failed to supply any evidence in support of the contention. Many other features are summarised in the report, all of practical economic advantage to our industries. References are supplied to the original accounts of the investigations, and these deserve the attention of works-managers, as well as their medical advisers.

[4] Menstruation in Schoolgirls, THE LANCET, 1930, ii., 57.

ANNOTATIONS

DETECTION OF BACTERIA IN MILK.

AN indictment of official methods of testing the bacteriological content of milk is made by Prof. James McIntosh and Dr. Lionel Whitby in our columns this week. As the outcome of investigations, extending over six years, on the milk supplied to the Middlesex Hospital, they criticise not only the standard technique of estimating bacterial content but the popular "holding" method of pasteurisation, and they emphasise the necessity for continuous as distinct from intermittent bacteriological control. Their contention is that on the whole the expensive high-grade products are outside the purse of the average hospital, and that for an institution the problem resolves itself into the purchase of milk of good average nutritional value. The examinations recorded in this article are mainly of samples of ordinary milk before and after pasteurisation, and of milk supplied to the hospital as pasteurised milk. In view of their bacterial findings on milk pasteurised by the "holding" method, they submit that the "flash" method is preferable. This view was formed after examination of samples sold to the hospitals as "pasteurised milk"—that is milk which under Milk (Special Designations) Order, should not contain more than 100,000 organisms per c.cm. During the warm weather, May to September, these samples have often been found to have a bacterial content of several millions. Furthermore, many millions of viable organisms per c.cm. were found in some samples of pasteurised milk sent to these authors for examination in the summer of 1928 by the M.O.H. of Islington. The results of the analyses "came as a bombshell" to the dairy company concerned, which is known to take great pains to supply the public with clean and wholesome milk. A very opportunity was given for confirmation and comparison of results, and eventually the discrepancies were traced to a difference in the technique of the examination, the Middlesex Hospital workers having used a richer medium than that recommended in the Circular issued by the Ministry of Health. The main thesis of their important communication is that a richer medium should be officially adopted for routine examination, since bacteria which resist the "holding" method of pasteurisation in common use may escape detection when cultures are made on the lemco-peptone agar at present recommended by the Ministry. The preference expressed for flash pasteurisation follows naturally on the smaller numbers of bacteria obtained from samples of milk thus pasteurised.

TUBERCULOUS BACILLÆMIA IN ACUTE RHEUMATISM.

FOR many years now in Vienna blood cultures for tubercle bacilli have been made by Prof. E. Loewenstein; the blood of at least 4000 cases has been examined, and from these experiments the following facts have emerged. In healthy persons tubercle bacilli have never been found, nor are they found in the blood of patients with carcinoma, sepsis, enteric fever, pneumonia, or venereal diseases. Tubercle bacilli can be found at times in the blood of all progressive forms of tuberculosis, especially during exacerbations. This is true not only of pulmonary tuberculosis but also of tuberculosis of the skin, larynx, kidney, and eye. For instance, in tuberculous skin lesions—tuberculides, Bazin's disease, lupus erythematoides, &c.—according to the latest reports positive blood cultures have been obtained in 51 of 92 cases (55 per cent.);[1] the figures available when we last commented on this work (see THE LANCET, May 23rd, 1931, p. 1147) were 41 positives out of 66 cultures made in cases of tuberculous skin lesion—that is, 62 per cent. Another important fact that emerges is that tubercle bacilli seem to be found with a very considerable frequency in diseases which till now were not commonly regarded as tuberculous in origin. In so-called acute rheumatic polyarthritis positive blood cultures have recently been obtained in at least 24 cases; within the short space of four months seven young women was admitted to one clinic in Vienna with typical rheumatic joint and cardiac lesions, showing tubercle bacilli in the blood, in some cases cultured on several occasions.[2] In children with acute rheumatism, pure cultures of tubercle bacilli, pathogenic to rabbits, fowls, and guinea-pigs, were frequently obtained. And now[3] Loewenstein describes his success in obtaining four positive blood cultures from cases of chorea; 17 positive blood cultures from 40 cases of disseminated sclerosis; in cases of retrobulbar neuritis 4 out of 6 cultures made were positive, and in cases of schizophrenia 9 out of 24. It is admitted that 7 of the 17 cases of disseminated sclerosis had signs of pulmonary disease, and one case at autopsy showed obvious pulmonary tuberculosis. This resemblance between rheumatism and tuberculosis has long been a matter of comment. Poncet, in 1909, described cases of tuberculous rheumatism, and many suggestive cases have since been published, especially in France. A short description of this relationship, with references, can be found in Recent Advances in the Study of Rheumatism (London, 1930), although the authors do not mention Loewenstein's work. Another curious link between acute rheumatism and tuberculosis is in connexion with the disputed ætiology of erythema nodosum. Loewenstein has shown that in tuberculosis positive cultures are found in the spring rather than in the autumn and winter. Forty patients with skin tuberculosis, in whom blood cultures were made every two to three months, were followed up for a period of one and a half years. A few were persistently positive, but the majority became negative in autumn and winter, only to relapse in the following spring. Is the seasonal incidence of rheumatism and chorea to be explained on similar lines? Are the exacerbations and recrudescences to be attributed to a tuberculous bacillæmia? Although tubercle bacilli have been cultured from the blood in cases of so-called rheumatic arthritis, morbid anatomy and histology do not support the view that tuberculosis is the pathological basis of a polyarthritis or carditis. Tuberculosis, especially of a severe degree, has always been rife in Vienna, although it must be noted that in the cases of skin tuberculosis the blood for Loewenstein's investigations was taken from patients all over Europe, in cities as far apart as Hamburg, Bergen, and Copenhagen. A curious feature of Loewenstein's rheumatic cases with a positive blood culture was that the Pirquet and Mantoux tests were frequently negative, although, according to many authorities, a tuberculous bacillæmia is necessary for the establishment of allergy to tuberculosis. Loewenstein's work does not depend merely on the demonstration of stained tubercle bacilli, but on their actual culture from the blood, and since his technique is apparently not difficult, it is highly desirable that his work should be repeated in this country.

[1] Loewenstein, E.: Münch. med. Woch., 1930, lxxvii., 1662.
[2] Reitter, Carl, and Loewenstein: Ibid., 1930, lxxvii., 1552.
[3] Loewenstein: Ibid., June 26th, 1931, p. 1080.

CLIMATOLOGY IN MEDICINE.

THE medicine of a hundred years ago made use of remedies very like those of the present day—namely, drugs, diet, and environmental and physical influences such as climate and baths. With intensive use of the experimental method has come a better understanding of the effect of drugs and diet, and besides leading to the discovery of new remedies this has shown the correct application of old ones, so that results can now be predicted which were previously uncertain. So far from disproving the efficacy of the older forms of treatment, however, modern experiment has usually served rather to show their true basis while at the same time defining their purpose and limitations.

With the advent of this new knowledge of diet and drugs, climatic therapy has fallen somewhat into the background. Despite countless observations on many of the factors at work—such as air temperature and moisture—there is as yet little correlation of these data with physiological reactions, and there are probably many factors involved which are at present imperfectly understood. In Germany climatic and spa treatment has always taken a relatively important place, and the movement towards their scientific study has lately been conspicuous there. The many papers appearing in the German medical press this year show clearly, however, that climatic therapy is still mainly in the empirical stage. The difficulty of adapting the experimental method, as A. Loewy[1] points out, is the large number of variables not under direct control as in laboratory conditions. Then again the climatic conditions regarded as typical of a certain locality are constantly being upset by temporary weather effects. Thus sea air increases the respiratory exchange and the metabolic rate,[2] but a person residing on the coast is only thus influenced, it is said, as long as the sea wind is blowing. Again, heat loss depends not merely on air temperature, but also on ground temperature and wind speed. Thus localities where the cooling values, as estimated instrumentally, are similar, may have widely different climatic conditions. The most definitely known effects at present, apart from ultra-violet radiation, are those of high altitudes, where oxygen-lack stimulates respiration, increases hæmoglobin, and raises the blood pressure. Sea air also has a stimulating effect, and there are indications that the particulate matter especially present in the air of low-lying inland places may be of importance by virtue of its chemical nature or electrical charge. In this as in other branches of

[1] Deut. med. Woch., May 6th, 1931, p. 789.
[2] Münch. med. Woch., April 3rd, 1931, p. 566.

medicine much is known, but little is yet applicable to practical therapeutics. In addition to studying the types of climate there should be a more determined attempt to assess the results of treatment of certain diseases under different climatic conditions. This experiment would have to be done on a large scale if the results were to be of any value, but there is at least a big field open here for those who have the necessary opportunities.

RECENT WORK ON DIPHTHERIA.

THE May issue of *Annales de Médecine*, which has lately reached us, contains 13 papers, from eight different countries, on the epidemiological, bacteriological, and clinical aspects of diphtheria. In a short note on experience in Paris during the last five years Émile Roux points out that though cases of malignant diphtheria have been more numerous in France, as in other European countries, since 1926, in Paris the case mortality during this period has been comparatively low, and there has been no increase in the incidence of the disease. He emphasises the importance of early administration of antitoxin, which, he maintains, it is a mistake to regard as curative, its action being merely to prevent the spread of intoxication. J. von Bokay gives a short history of diphtheria at Budapest since 1884, when the disease was first made notifiable, and draws attention to the increased severity and prevalence of faucial attacks, whereas there has been a considerable fall in the incidence of laryngeal cases. In a biological and immunological study R. Debré, G. Ramon, and P. L. Thiroloix come to the conclusion that the severe forms of diphtheria, especially those which end fatally, are produced by organisms with a remarkably high pathogenic power, although they admit that individual resistance, as determined by estimation of the antitoxin in the blood, must also be considered. In their paper on the general character of diphtheria in the French army since the war, C. Dopter and Collignon show that diphtheria has increased during this period in the army, as in the civilian population, especially in certain garrisons. Systematic active immunisation, however, has had such an excellent effect in reducing the incidence that a Bill is being prepared to make this practice compulsory, as has been done in the case of inoculation against typhoid fever. In a paper on latent infection in diphtheria, U. Friedemann, of Berlin, maintains that the influence of latent immunisation on the incidence of diphtheria is greater for diphtheria than for scarlet fever, but less than for poliomyelitis, diphtheria being an endemic disease in all civilised countries, in contrast with poliomyelitis, which is essentially an epidemic disease. E. Gorter describes a severe epidemic at Leyden, in 1930, characterised by a predominance of toxic cases and an unusual frequency of subsequent paralysis. Prof. and Madame Hirszfeld, of Warsaw, discuss the constitutional basis of the Schick reaction, and refer to their researches showing that if both parents have a positive reaction the reaction is almost always positive in their children, while if the parents have a negative reaction, two-thirds of the children are negative and one-third positive, and, lastly, if one parent is positive and the other negative 56 per cent. of the children are positive.

P. Lereboullet, J. J. Gournay, and J. Donato, who discuss the renal function in diphtheria with a record of eight illustrative cases, come to the conclusion that renal involvement, as shown by hyperazotæmia and albuminuria, does take place in diphtheria, but that clinical, anatomical, and experimental evidence does not favour the view that this involvement is so serious as in scarlet fever, and, in any case, it is much less important than affection of the heart, suprarenals, and central nervous system.

In an article on the serum treatment of diphtheria, Ramon and Debré hold that the charges of inadequacy brought against diphtheria antitoxin in the recent severe outbreak of diphtheria on the Continent are not justified, and incriminate the malignancy of the attack, delay in administration of antitoxin, and association with other infections, as responsible for its apparent failure. They add that the generalisation of active immunisation by anatoxin is the only certain method of protection against diphtheria. H. Roger, C. Mattei, and J. Paillas, who have collected 70 cases of paralysis of the brachial plexus following serum treatment of any kind, emphasise the rarity of this sequel, especially in the case of diphtheria antitoxin, of which only nine examples have been recorded, in contrast with 40 following injection of tetanus antitoxin. Bela Schick and Anne Topper, of New York, confirm their previous observations, showing that tonsillectomy and adenoidectomy tend to convert a positive Schick reaction into a negative one, and thus increase immunity to diphtheria. They suggest that children with diseased tonsils, who are hypersensitive to horse serum, should have them removed, and that children who have undergone tonsillectomy within the last six months should be Schick-tested before being immunised by toxin-antitoxin, or anatoxin. S. Schmidt, of the Danish Serological Institute, deals with the affinity between toxins and their specific antitoxins. The history of diphtheria in Berlin is narrated by E. Seligmann, who deals especially with the remarkable recent increase in its severity, the case mortality having risen from 5·8 per cent. in 1924 to 11 per cent. in 1927, and being almost as high in school-children as in younger patients. Like the other writers, he insists on the value and harmlessness of active immunisation.

EPHEDRINE.

THE purpose of the series called "Medicine Monographs" is to provide, in convenient and readable form, critical digests of recent views on various aspects of medicine. Volume XVII. on "Ephedrine and Related Substances" [1] adequately fulfils that purpose. The teacher and clinician will welcome a succinct account of the history, pharmacognosy, and chemistry of the genus ephedra, and the pharmacological action and therapeutic uses of ephedrine, by one who has been mainly responsible for extending our knowledge of this important drug. The laboratory worker will be interested especially in the questions raised by the work on ephedrine and related substances regarding the difficult problem of the relation of chemical composition to pharmacological action, and the incompleteness of our knowledge of the mode of action of sympathomimetic drugs. He will also find of great value the compilation of published papers on the subject. A curious fact, not generally known, is that though ephedrine has only recently risen to popularity, and thus justified the traditional faith of the Chinese in one of their ancient remedies, the drug was known and experimented with 30 years before its possibilities were appreciated. At that time only toxic doses were employed, and the drug was set aside as being unlikely

[1] Ephedrine and Related Substances. By K. K. Chen, Department of Pharmacology, Johns Hopkins University, and Carl F. Schmidt, Department of Pharmacology, University of Pennsylvania. London: Baillière, Tindall and Cox. 1930. Pp. 121. 11s. 6d.

to be of value. Dr. Chen's work showed more clearly its true action. It resembles adrenalin, in that, in suitable doses, it raises the blood pressure, increases cardiac activity, relieves broncho-spasm, and dilates the pupil, while it more frequently inhibits than stimulates the gastro-intestinal tract. It has, however, the special advantage over adrenalin in that it is a stable substance. Its solutions do not decompose on exposure to air, light, or heat, or by long standing. It is easily absorbed, and has a low toxicity. It can be applied locally; and since it is not destroyed by the gastro-intestinal secretions it is active when given by the mouth as well as by subcutaneous injection. Because of these actions it has found many clinical uses, but the review suggests that it is especially valuable in relieving spasm of the bronchial muscle in such conditions as bronchial asthma, hay-fever, bronchitis, and whooping-cough, in combating the fall of blood pressure in spinal anæsthesia, and in shrinking the congested nasal mucous membrane. The introduction of ephedrine into the clinic is an important contribution to symptomatic treatment, but the remedy is not ideal, for it may produce side-effects, such as palpitation, trembling, faintness, and insomnia. Some of these symptoms are perhaps inevitable with a drug which has the general pharmacological action of ephedrine, but there is hope that important progress will be made in the search for related substances which will have all its advantages and none of its drawbacks.

FOREIGN BODIES IN THE EAR AND NOSE.

AMONG 15,000 children examined at a clinic for nose, throat, and ear defects, Mr. J. A. Keen [1] found 73 cases of foreign bodies in the nose or ears—an incidence of rather less than 0·5 per cent. All but two came to the clinic for some other reason. Of foreign bodies in the ears, the commonest (22 out of 43) were small pieces of cotton-wool deep in the meatus, usually beyond the isthmus. Removal with fine dressing forceps is easy, but syringing often fails to dislodge them and forcible syringing is not, of course, advisable in the presence of otorrhœa. Often removal of the wool stopped a discharge which had been unsuccessfully treated for weeks. The other foreign bodies (21 cases) included cardboard, beads, slate pencils, and crayons. Glass beads were particularly difficult to remove and the best instrument was found to be a malleable silver probe, whose end could be bent into a fine hook which could be slipped into the eye of the bead. A small foreign body which has been in the meatus for some time becomes surrounded by cerumen and its presence is not suspected. In no case in this series was operation needed, as it sometimes is in children under four, but occasionally an anæsthetic was required. Most of the 30 foreign bodies in the nose were beads and buttons, but one was a pure rhinolith. About half the children were dealt with in the out-patients' department, a little 10 per cent. cocaine solution being applied to the septum and the anterior part of the inferior turbinals. The instrument used was the malleable probe introduced above the foreign body and worked downwards, or the ordinary nasal dressing forceps. One case was the starting point of a long and fatal illness resembling the rare disease described as rhinitis caseosa by StClair Thomson. The most important aspect of foreign bodies in the nose, however, is their association with nasal diphtheria. Burton and Balmain [2] say that in children suffering from a chronic unilateral nasal discharge (sent to isolation hospital because a nasal swab is positive to the Klebs-Löffler bacillus), this association is common. These children did not suffer from clinical diphtheria, though they may be carriers, and the nasal diphtheria is cured by the removal of the foreign body. Mr. Keen admits that text-books advise that a culture of the nasal secretion should be taken before removal of a foreign body, but in his experience this is not advantageous.

[1] Jour. Laryng. and Otol., 1930, xlv., 333.
[2] THE LANCET, 1929, i., 977.

RAMISECTION IN SPASTIC WEAKNESS.

JUST a year ago we published a paper [1] by a group of London orthopædists and neurologists in which they described six cases operated on by Mr. N. D. Royle for spastic weakness, and gave their opinion that the operation appears to have no place in the treatment of this condition. It will be recalled that this verdict was by no means accepted by Mr. Royle,[2] nor by some of his supporters in Australia and America. Accordingly, the Royal College of Surgeons of Australasia, at its annual meeting, has appointed a committee to investigate in Victoria the condition of patients on whom the operation has been performed. The members [3] are Prof. F. Wood Jones, F.R.S. (chairman), Sir Richard Stawell, Dr. Fay Maclure, Dr. H. C. Trumble, Dr. A. E. Coates, Dr. J. B. Colquhoun, and Dr. H. F. Maudsley. Another committee is to report on cases in New South Wales.

HEAD MURMURS.

Dr. Louis Hamburger [4] revives the interesting subject of auscultation of the head. As long ago as 1833, he says, Dr. John Fisher suggested that auscultation might prove an important means of diagnosis of cerebral diseases, but for many years little attention was given to it.

The murmurs, Hamburger points out, may be either intracranial, extracranial, or infracranial in origin. Of the first group—those arising inside the skull—the systolic murmurs of childhood are pretty well known. They may be heard especially during the second year of life, and not infrequently below this age. They may be detected in quite healthy babies, but are very seldom heard after the age of four, and almost never persist into adult life. Anæmia and rickets are thought to be contributory factors in their causation, but the way in which they arise is not exactly explained. Hamburger, however, feels sure that they are without pathological significance, and suggests that frequent examination for them would more often demonstrate their presence. At the same time it might occasionally give rise to needless despondency, as apparently happened in a case which he mentions. The second group of murmurs are those accompanying arterio-venous aneurysms, and though, of course, rare, they are well recognised as arising either from trauma or "spontaneously," in which case they are often congenital. The latter group may be due to aneurysmal angiomata; the former may result, as in cases of "pulsating exophthalmos," from a communication between the internal carotid artery and the cavernous sinus following fracture of the base of the skull. Such, however, are real surgical rarities. A third group of murmurs are those found with intracranial tumours.

[1] THE LANCET, 1930, ii., 127.
[2] Ibid., p. 1209.
[3] Med. Jour. Australia, May 23rd, p. 637.
[4] Amer. Jour. Med. Sci., 1931, clxxxi., 756.

such as meningiomas and gliomas, but they are exceedingly rare, whilst in uncomplicated intracranial aneurysms a murmur is almost never present. Occasionally there may be vascular communications between the external and internal blood-supply of the skull, producing a murmur on auscultation. In the final group of cases head murmurs are conducted upwards from the carotids, and include those occurring in severe arterio-sclerosis, in exophthalmic goitre, and sometimes with valvular disease of the heart. These may be noticeable to the patient as well as to the observer.

As a rule the detection of a cephalic murmur is of academic rather than practical importance, though in the diagnosis of arterio-venous aneurysm or angiomata it may be of great value. A revival of cephalic auscultation, in the absence of a full realisation of its limitations, would add to the anxieties of practitioners, without much increasing the information at their command.

VENEREAL DISEASE IN THE BRITISH EMPIRE

THE fifth Imperial Social Hygiene Congress organised by the British Social Hygiene Council opened in London on July 13th under the chairmanship of Mr. L. S. Amery, and the first day was devoted to a review of social hygiene and venereal disease throughout the Empire. Dr. David Lees, chairman of the medical advisory board of the Council, remarked that every country in the world contains enough infected people to constitute a grave problem. There were, he said, striking examples—in Cyprus, Malaya, and Madras, for instance—of what could be attained in spite of great difficulties by careful expenditure on the three essential methods of combating venereal disease: education and public enlightenment; free and efficient treatment; and an adequate staff able to deal with the problem sympathetically and from the public health point of view. Legislative measures, in his opinion, had not been in force long enough to allow a fair estimate of their success. Nevertheless the representatives of Australia and New Zealand maintained that the legislative enactments in those countries had yielded highly satisfactory results. Dr. F. McCallum, reading a paper by Dr. M. J. Holmes, Director of the Division of Tuberculosis and Venereal Disease, said that in Australia the control of the disease was based on treatment by qualified medical men only; an obligation on sufferers to place themselves under treatment without delay; a written warning of the consequences and dangers of the disease, handed to the patient by the doctor; compulsory, impersonal, and confidential notification; and personal but confidential notification of default. Similar regulations are in force in New Zealand, where gonorrhœa and syphilis were declared in 1924 to be infectious diseases, thus giving the Department of Health the same powers as in dealing with other infectious diseases—viz., the power to order an infected person to hospital and to institute legal proceedings against anyone who wilfully permits or suffers any act likely to infect another. Dr. Bernard Myers, presenting a report by Dr. Watt, Director-General of Health for New Zealand, endorsed this encouraging view of legislation but commented on weak spots in the system: fictitious names and addresses given by patients; treatment of venereal disease by chemists; and the failure of medical practitioners to comply strictly with the law. It is hoped that the ethical bodies of the doctors and pharmacists will be able to deal with this trouble.

Among the many reports presented from other Dominions and Colonies, India was represented by that of Col. A. J. H. Russell, and Madras in particular by a report from the Surgeon-General. Unfortunately in many parts of India "financial stringency"—a false view of economy, as many would say—has prevented progress. There is still a great lack of welfare work among sailors, particularly Indian sailors, in the ports, and salvarsan and kindred drugs have not yet been exempted from customs duty. Sir Ronald Storrs gave an account of his experience with a military government in Jerusalem. The brothels had been immediately closed throughout Judea and their occupant repatriated; a women's social council had been formed and a social welfare worker appointed. In Cyprus the Government had appointed a social hygiene council, a venereologist, a bacteriologist, and a social worker, and there had been a steady arousal of interest among the women of Cyprus. The Cyprus clinics were now the best in the world, because the most recent. In three years 12,000 cases had been treated and a reduction of 32 per cent. in the incidence had been effected. In Basutoland, Dr. K. H. Dyke reported that an average of 7000 new out-patients are seen in the dispensaries every year and syphilis is widely prevalent. One of the chief troubles of the district is that the natives have no dread of the diseases, but fortunately they like having injections and it is therefore easy to use the sulfarsenol which the Government has provided this year. The treatment of gonorrhœa has not been attacked actively. In Zanzibar Dr. S. M. Vassallo finds a curious mixture of modesty and the reverse. Modesty unfortunately begins with the necessity for treatment, and, although inoculation has made a great impression on the natives' imagination, this effect has the disadvantage that they expect inoculation for everything. Dr. R. S. Taylor ascribed a great increase in venereal disease in Somaliland to famine, which had driven women to vice. Dr. J. W. Graham, medical officer of Tanganyika Territory, declared that the future of Africa was in the hands of the women. With their emancipation the social customs of the Africans would be greatly improved.

The Conference continues throughout the week and other aspects of the problem are being discussed.

A NEW FLOCCULATION TEST.

FLOCCULATION tests for syphilis which depend on the fact that precipitation occurs when a syphilitic serum is treated with organ extracts, are of most use in treated cases of syphilis where they remain positive longer than the Wassermann reaction does. It would appear that more lasting results are obtained when the duration of treatment is controlled by application of a flocculation test. In the most recent comparative survey of the value of the different flocculation tests with known sera,[1] the Kahn test produced the most satisfactory results, giving no false positives and showing itself to be more sensitive than the Wassermann reaction in treated cases. The Vernes reaction presents a theoretical advance on the other methods inasmuch as it minimises the personal error by introducing mechanical mixers and photometric readings. This reaction fails, however, in comparison with other flocculation tests because of the expensive apparatus required and because it is certainly not less sensitive to treatment than the Wassermann reaction. In the newer tests the Meinicke clarification reaction and the Kline show great promise since

[1] Brit. Jour. Ven. Dis., 1931, vol. vii., No. 2.

they give a high degree of agreement with the minimum of manipulation. For the new Meinicke test it is claimed that hæmolytic, icteric, and cloudy sera are all adaptable to the reaction, and that a falsely positive result can never be produced by the admixture of blood or other contaminations with the sera. It is a modification of the author's turbidity reaction and was first described by him in 1929. Dr. W. Ogden and Mr. F. Partner, working at the Central Pathological Laboratory of the London County Council Mental Hospitals, have compared the new Meinicke clarification reaction with the Wassermann reaction and find total agreement in 96·6 per cent. of sera. (see p. 121). Of those sera showing disagreement the results were in favour of the Meinicke. This test is said to be easy to read and can be performed rapidly with small quantities of serum (micro-reaction), though the macro-reaction is regarded as more reliable. It is held to be desirable that workers using this test should adhere to the method described by its originator.

TREATMENT OF HICCUP.

PERSISTENT hiccup, which may cause much discomfort and distress and even endanger life, is often difficult to relieve. R. F. Sheldon [1] amongst others has shown that carbon dioxide inhalation, by its direct action on the respiratory centre, is the most reliable means of re-establishing normal breathing. A great objection to this form of treatment is, of course, the need for cumbersome and expensive apparatus. L. A. Golden,[2] however, uses an ordinary paper bag which is placed tightly over the mouth and nose. The patient is instructed to breathe into the bag, and by rebreathing his expired air raises the concentration of carbon dioxide in his blood until, in five minutes or so, the spasmodic inspirations are replaced by regular ones.

THE SELECTION OF OUT-PATIENTS.

IT was to be anticipated that one of the most interesting discussions at the recent joint conference of the British Hospitals Association and the Incorporated Association of Hospital Officers at Eastbourne was that which dealt with the out-patient department.[3] The voluntary hospitals are having to cope with an almost alarming increase, not only in the number of out-patients, but in the ratio of their attendances. Since 1920 the out-patients of the London teaching hospitals have grown by something approaching 10 per cent. in number and by close upon three times that percentage in attendances. These attendances are now little short of four millions in this group of hospitals alone, and almost every annual report from institutions all over the country records a corresponding increase. The papers which formed the basis of the discussion were read by Mr. W. Parkes, the secretary of St. Mary's Hospital, Paddington, and Mr. W. McAdam Eccles, consulting surgeon to St. Bartholomew's Hospital, whose joint experiences cover the administrative and the medical aspects of this subject. There was general agreement both in the addresses and in the discussion that, although, except as regards chronic cases, there is not much real abuse of the out-patient system, some means of limiting the numbers will have to be found, not less for the sake of the medical staff than of the patients. The limitation must not be too rigid. Access to a hospital must be reasonably easy, and, as Mr. Eccles put it, it is essential that there should be "a good and varied supply of out-patient material for teaching purposes."

The crucial question is how this limitation is to be brought about. To eliminate the "chronic ordinary" is clearly the first step—if an out-patient department is to be a real consultative centre he is matter out of place, standing in the way of those who are really in need of specialised advice and treatment. The recommendation that a doctor's letter should be an essential passport for an out-patient department appears to have obtained something less than general assent at the conference; the alternative is a laborious winnowing process at the hands of the medical staff and their assistants. Closer understanding and coöperation between local medical practitioners and the hospital staffs would obviously make it easier to discriminate cases needing help from a consultant, though this does not imply refusal to admit the right of the remainder to present themselves at the hospital. The voluntary hospitals cannot risk getting a bad name because their rules are too rigid in this respect. But the present unorganised system not only invites abuse, but entails another form of discipline more irksome sometimes than exclusion. The dreary wait in the out-patients' department will have to be mitigated somehow. We drew attention recently [1] to the efforts made in some hospitals to make and keep appointments, pointing out that such appointments can be made for small groups rather than individuals to secure continuity of attendance without gaps. The careful reorganisation involved would be repaid in the better atmosphere, and possibly even in increased donations from those who appreciate being treated with consideration.

[1] Anæsth. and Analg., 1927, vi., 31.
[2] New Eng. Jour. of Med., June 4th, 1931, p. 1183.
[3] The Hospital, July 1931, p. 152.

AN APOLOGY.

BY the courtesy of the Board of Control a proof of the Annual Report for 1930 was sent to THE LANCET in common with other medical journals. Such advance information is supplied in order to allow sufficient time for perusal before publication of the Report, on the understanding that no comment will be made before a copy is received from H.M. Stationery Office. By a series of mischances the usual precautions against premature publication proved ineffective, and a notice of the Report, which has not yet been issued, appeared in THE LANCET on July 11th. We greatly regret this unfortunate incident, and offer full apologies to the Board.

WE have to announce the death of Mr. Francis Richardson Cross at Clifton, on Sunday last, at the age of 83. Mr. Cross was consulting ophthalmic surgeon to the Bristol Royal Infirmary and a former President of the Ophthalmological Society. He served on the Council of the Royal College of Surgeons of England for 16 years.

INDEX TO "THE LANCET," VOL. I., 1931.

THE Index and Title-page to Vol. I., 1931, which was completed with the issue of June 27th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

[1] THE LANCET, 1931, i., 595.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCXVII.

THE TREATMENT OF DYSHIDROSIS OR CHEIROPOMPHOLYX.

DYSHIDROSIS was first described by Tilbury Fox and at about the same time by Hutchinson who named it cheiropompholyx. From that time to the present day the condition has been the subject of lively controversy in all parts of the world. The eruption, which is accompanied by considerable itching, occurs chiefly on the lateral aspects of the fingers and toes, and on the palms and soles, though it may involve also the dorsal aspects of the toes, feet, and hands, and occasionally may extend to the wrists and forearms. It consists of pearly vesicles embedded in the epidermis which in severe cases may become confluent to form bullæ of considerable size. In the palms and soles the vesicles are deeply situated, and owing to the thickness of the overlying horny layer they seldom rupture. They feel shotty and have aptly been compared to sago grains embedded in the skin. In mild cases the lateral aspects of the fingers only may be affected. Dyshidrosis occurs, as a rule, in hot weather and affects chiefly subjects who sweat freely. The duration of an attack varies from three to six weeks. While the acute vesicular stage is usually over in from 10 to 14 days, a desquamative stage follows which may last for several weeks.

Dyshidrosis Complicating Recognised Dermatoses.

As the name implies, Tilbury Fox regarded dyshidrosis as a disorder of the sweat apparatus, but this view lost favour as the result of further studies by English and Continental investigators, who found no histological evidence of damage to the sweat glands or their ducts. At the present moment there are some who, doubting its existence as a clinical entity, believe that dyshidrosis is merely a special aspect of a number of well-known dermatoses. The following case illustrates this point of view. An elderly lady had suffered for about a year from attacks of typical dyshidrosis affecting especially the hands. She had undergone treatment at a Continental spa without relief. The cause was discovered in a very chronic interdigital ringworm infection of the toes. Examples of this kind could be multiplied indefinitely.

An examination for fungus should be made in every case of dyshidrosis. The cause is usually the *Epidermophyton inguinale*, a fungus which has a predilection for moist intertriginous surfaces. The toes are very commonly attacked and in this situation the infection is nearly always chronic. The fungus secretes an endotoxin which entering the blood stream gives rise to a dyshidrosiform eruption on the hands. This mechanism has been demonstrated by human experiment and explains the frequent absence of fungus in the acute vesicular eruption of the hands. The acute vesicular eruption may, on the other hand, be due to direct infection.

Ringworm infection disposes of an important proportion of the cases of dyshidrosis. The thrush fungus *Monilia albicans* is also capable of causing dyshidrosis, and recognition of its importance is growing. A number of exogenous irritants may produce a condition objectively identical with dyshidrosis. The subjects attacked are chiefly those who suffer from hyperhidrosis of the palms and soles. The hands are attacked first and, by a mechanism not yet explained, the feet often follow suit. The exogenous origin is elucidated by careful inquiry regarding the patient's occupation.

Dyshidrosis may be a manifestation of seborrhœic eczema. It is well recognised that chronic seborrhœic eczema of the scalp and of other parts may be accompanied by an eruption of the palms and soles identical with dyshidrosis. Dyshidrosis may accompany seborrhœa, or seborrhœa with dandruff, but here it is perhaps a question of true dyshidrosis. Dyshidrosis may be a manifestation of eczema of any type, for example, chronic varicose eczema, pruritus ani, with eczematization, &c. In such cases dyshidrosis is probably due to sensitisation of the skin of the palms and soles by the products of tissue autolysis derived from the chronic foci.

True Dyshidrosis.

Having thus considered the cases of dyshidrosis complicating well-known dermatoses it is necessary to inquire whether there are any left which may be regarded as true dyshidrosis. The question may be answered by stating an indisputable fact—namely, that there are many who, in the complete absence of any of the causes already enumerated, develop dyshidrosis every summer or even at intervals throughout the year. Further, the attacks follow the typical course already described lasting from three to six weeks, though many mild cases affecting only the fingers are known. Almost all cases have hyperhidrosis. It is, in fact, probable that the conception of Tilbury Fox will prove eventually correct and that time will demonstrate beyond doubt the existence of a true dyshidrosis and of a causal disorder of the sweat apparatus. Evidence of such a disturbance has already been reaffirmed by Sicoli, who has demonstrated dilatation with occasional rupture of the intra-epidermal portion of the sweat ducts, in cases of dyshidrosis. Unfortunately, owing to the difficulty of collecting sweat in adequate quantities, its chemical composition in normal and in pathological states such as dyshidrosis does not yet appear to have been the subject of important study. It is, however, known that variations in its composition occur under varying physiological conditions—for example, lactic acid is excreted in quantity at certain stages of muscular training. While mere mechanical dilatation of the sweat ducts due to explosive secretion of sweat as suggested by Sicoli may not prove the whole explanation of dyshidrosis, it is possible that future studies of the chemistry of sweat may provide a further clue to its pathogenesis.

It is clear that the diagnosis can only be made by exclusion. It may not be difficult to eliminate the cases of dyshidrosiform eruptions due to obvious exogenous causes or those which accompany eczema of other parts; the treatment of such cases must be that of the cause. But it may be extremely difficult, when the eruption is limited to the palms and soles, to eliminate fungus infection. Indeed so many cases of dyshidrosis are caused by ringworm infection that it is desirable to consider the treatment of the disease under two headings: (1) mycotic dyshidrosis; (2) true dyshidrosis.

Mycotic Dyshidrosis.

Regarding dyshidrosis as a special type of eczematous reaction, it is a remarkable fact that cases of mycotic origin will tolerate strong fungicidal preparations that would be harmful in non-mycotic or true

dyshidrosis. When the presence of *Epidermophyton interdigitale* has been demonstrated one should not hesitate to attack it vigorously. The interdigital spaces should receive the greatest attention, and it is important to realise that the infection is nearly always difficult to cure in this position; it may, in fact, be of life-long duration. The spaces are generally lined with tough dead white sodden epidermis, and the fungus proliferates freely beneath this protective covering, to remove which strong keratolytic preparations are necessary. Whitfield's benzoic and salicylic acid ointment may be effective:—

Benzoic acid	grs. 25
Salicylic acid	grs. 15
Soft paraffin	drs. 2
Coconut oil	to 1 oz.

or the following paint also suggested by Whitfield:—

Benzoic acid	grs. 25
Salicylic acid	grs. 15
Acetone	drs. 2
Spirit	to 1 oz.

Sabouraud recommends the preliminary application of a depilatory paste, e.g.:—

Barium sulphide	1
Quicklime	10
Rice starch	10 (Darier)

to be mixed with a little glycerin to make a paste and applied from half to three-quarters of an hour daily.

He states he has succeeded in curing interdigital epidermophytosis only by such preliminary treatment.

After the horny debris has been thoroughly softened and removed a paint may be applied twice daily:—

Chrysarobin	dr. 1
Acetone	drs. 4
Spirit	to 1 oz.

or carbol fuchsin paint (Castellani):—

Saturated alcoholic solution of basic fuchsin 10 c.cm.
Five per cent. aqueous solution of phenol .. 100 c.cm.
Filter and add boric acid, 1 g.
Stand for two hours, add acetone 5 c.cm. Stand for two hours, add resorcin, 10 g. Keep in a dark bottle.

For the dyshidrosiform eruption the feet and hands may be soaked twice daily in a solution of potassium permanganate, 1 in 500 to 1 in 1000, together with nightly applications of Whitfield's ointment. If the latter be applied for too long a period, however, it may itself cause an irritant dermatitis and should then be replaced by an emollient preparation such as cold cream.

True Dyshidrosis.

The above treatment would be disastrous in the case of non-mycotic dyshidrosis. As already stated, this condition runs a limited course and no means of aborting an attack in the early stages are yet known. The methods of treatment applicable to the various stages of eczema should be employed. In the acute vesicular stage simple lotions or watery pastes are best—e.g., lead lotion, calamine lotion, or the following preparation: glycerin, talc, zinc oxide water, āā p. æ. If secondary pustular infection be present it is advisable to open and swab the pustules twice daily with an antiseptic lotion, e.g.:—

Copper sulphate	2
Zinc sulphate	7
Camphor water	300, diluted 1 in 10.

In the early desquamative stage creams and pastes should be employed, e.g.:—

	Ichthyol	♏ 5
	Zinc oxide, olive oil	āā 1 oz.
	Anhydrous wool fat	drs. 2
	Lime water	drs. 6
or	Zinc oxide, starch	āā drs. 1½
	Soft paraffin	to 1 oz.

In the final stages mild keratoplastic pastes may be employed, such as:—

Ichthyol	♏ 5
Liq. pic. carb.	♏ 30
Zinc oxide, starch	āā drs. 1½
Soft paraffin	to 1 oz.

Throughout the treatment it is advisable to keep the hands at rest as much as possible, and there is little doubt that complete rest in bed shortens the duration of an attack. As in eczema generally, soap and water is badly tolerated and the hands may be cleansed only with olive oil or normal saline.

Prevention.

Unfortunately, no dietetic restrictions or treatment with drugs appear at present to serve any useful purpose, and the only preventive treatment consists in mechanical inhibition of the activity of the sweat glands by means of X rays. In some cases this form of treatment has been remarkably successful. For example a boy aged 12, an out-patient attending the West London Hospital, had suffered for three years from frequent attacks of dyshidrosis; he was obese and sweated profusely. The course of X rays advised by Sicoli—namely, three doses of 4 H unfiltered at 15 day intervals—was given by Dr. Carter-Braine at the hospital. The attacks ceased and have not recurred after three years. Bigger dosage with heavy filtration has also been proved effective.

It must be admitted, in fact, that in the present state of knowledge regarding the pathogenesis of true dyshidrosis the only practical method of preventing future attacks is the purely mechanical measure of causing partial atrophy of the sweat glands by X rays.

G. B. DOWLING, M.D., M.R.C.P. Lond.,
Dermatologist to the West London Hospital; Assistant Physician to the Skin Department, Guy's Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. C. G. Rippin is placed on the retd. list.
R. M. B. Lowis to be Surg. Lt.
Proby. Surg. Sub-Lt. W. E. Thomas to be Surg. Sub-Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. C. A. Mather to *Victory* for Haslar Hosp.
Surg. Lt.-Comdr. (D.) A. G. Pridham to *Vivid* for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

Lt. A. Guirdham resigns his commn.
R. H. Small is granted a temp. commn. in the rank of Lt.

ARMY RESERVE OF OFFICERS.

Col. G. M. Goldsmith, late R.A.M.C., having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Lts. W. H. M. Jones, W. L. Lamb, and J. N. Russell to be Capts.
R. S. T. Sandberg (late Offr. Cadet, Lond. Univ. Contgt. Sen. Div., O.T.C.), A. D. Bourne (late Offr. Cadet R.Q.M.S., Lond. Univ. Contgt., Sen. Div., O.T.C.), and F. H. Taylor (late Offr. Cadet, Univ. of Durham Contgt., Sen. Div., O.T.C.) to be Lts.

MEDICAL PRAYER UNION.—In connexion with the British Medical Association's meeting next week, a medical missionary breakfast will be held under the auspices of the Union on Friday, July 24th, at Stewart's Restaurant, Victoria-place, Eastbourne, at 8.30 A.M. The chair will be taken by Dr. W. G. Willoughby, president of the Association, and an address will be given by Dr. A. R. Cook, of Uganda. Those who intend to be present are asked to inform Dr. Victor G. Williams, 6, College-road, Eastbourne.

SPECIAL ARTICLES

THE BACTERIOLOGICAL CONTROL OF MILK-SUPPLIES.

BY JAMES MCINTOSH, M.D. ABERD.,

DIRECTOR OF THE BLAND-SUTTON INSTITUTE OF PATHOLOGY, THE MIDDLESEX HOSPITAL; PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF LONDON;

AND

LIONEL E. H. WHITBY, *C.V.O.*, *M.C.*, M.D. CAMB., M.R.C.P. LOND., D.P.H.,

BACTERIOLOGIST TO THE MIDDLESEX HOSPITAL.

THE problem of obtaining an efficient and good milk-supply for an institution such as a hospital involves a consideration of the economic aspect, of the nutritional value, and of the cleanliness and wholesomeness of the milk.

The economic aspect is concerned not only with the question of actual cost, which, for an institution, must be reasonable and therefore tends to prohibit the use of high-grade milk, but also with the matter of keeping qualities which, being intimately bound up with the bacterial content and therefore controllable, has received considerable attention from the large dairy companies.

As to nutritional value there has been much discussion in the press and in Parliament as to the relative values of the different grades of milk, but on the whole the expensive high-grade products are outside the purse of the average hospital; for an institution the problem resolves itself into the purchase of milk of good average nutritional value.

The question of cleanliness and wholesomeness is one that can be partly safeguarded by modern methods and without undue expense. It is with this aspect that we have been mainly concerned. We have examined in a routine manner both for the total bacterial content, which largely governs the keeping qualities, and for the presence of pathogenic bacteria, particularly the tubercle bacillus. Our investigations on the Middlesex Hospital milk-supply have extended over some six years. As the result of our experience we feel justified in offering considerable criticism both of the standard technique for determining total bacterial content as well as of the popular "holding" method of pasteurisation, and we would emphasise the necessity for continuous as distinct from intermittent bacteriological control.

Standards of Cleanliness.

It is recognised that a limited number of bacteria are unavoidable contaminants, but large numbers are, with healthy cows, some index of the care and cleanliness in production, handling, transport, and storage. A sample which has a high bacterial content soon after milking shows either that the milking process has been carried out under unhygienic conditions or that the cow, owing to disease, is unfit to contribute milk to the pooled supply of the farm; in older samples, high bacterial content points to faulty storage, whilst a constant low count in an untreated sample indicates care at all the stages from the cow to the consumer. From the point of view of bacteriological control, examinations made should be both quantitative and qualitative, the former for an estimate of wholesomeness, a check on the handling and distribution, and the latter for detecting the presence of pathogenic bacteria. Thus the important features to insist on are: (1) the absence of living tubercle bacilli, (2) the absence of epidemic-producing bacteria, (3) a reasonable bacterial content such as will not impair the keeping qualities.

To meet these requirements three main methods have been advocated:

(*a*) Rigorous and expensive standards for cow, milker, method of milking and transport, with the object of supplying untreated milk with a low initial bacterial content—Certified Milk.

(*b*) Less stringent but still expensive methods for the production of the various forms of Grade A Milk (Grade A, tuberculin tested; Grade A; Grade A, pasteurised).

(*c*) The efficient pasteurisation of milk from reasonably well-conducted farms.

Types of Milk Examined.

GRADE A, T.T. MILK.

The legal standard under the Milk (Special Designations) Order, 1923, is a limit of 200,000 bacteria per c.cm. We have examined a number of samples of the Grade A, T.T. milk as supplied to the hospital, and on one occasion only the bacterial content was above the legal limit (Table I.). On two

TABLE I.—*Grade A.*

1925.	Bacteria per c.cm.	1927.	Bacteria per c.cm.
May	280,000	September	1,350
,, ...	2,375	,, ...	2,025
June	3,650	,, ...	7,500
,, ...	3,733	,, ...	1,900
July	35,500		
August	7,075	1931.	
September	5,150	May	5,125
November	5,966	,, ...	825
1926.			
January	1,227		
,, ...	652		

or three occasions, in the summer months, the supply has been sour before the sealed bottles were opened. It would seem, therefore, that unless a constant analysis is made there is no evidence that Grade A milk is always as pure as the labelled bottle would lead one to believe. The same case can be made against tuberculin-tested samples, for who is to say that a cow may not become tuberculous in the intervals between the tuberculin test.

Admittedly the nutritional value of Grade A milk is high but, in common with Ledingham[1] and the majority of medical men, we are of the opinion that in hospitals, at least, the Grade A milk should be efficiently pasteurised before distribution in the hospital. The inference from this opinion is that the value of Grade A milk is mainly nutritional and that provided a milk of similar character is obtained and efficiently pasteurised then there is no advantage at all in using the much more expensive Grade A and Certified products.

ORDINARY MILK.

For the past six years regular quantitative analyses of the churn milk supplied on contract to the Middlesex Hospital have shown that the milk, as supplied, has such a high bacterial content, particularly in the summer months, that the keeping qualities are almost negligible (Table II.). Examinations for tubercle bacilli by animal inoculation have from time to time proved positive.

The efficiency of the hospital pasteuriser has been checked by parallel analyses made before and after

pasteurisation (Table II.) and these show that the initial high bacterial content can be reduced to a few thousands per c.cm. No tubercle bacilli have been detected in the pasteurised samples. The necessity for keeping a regular watch on the efficiency of a pasteuriser has been evident from time to time.

TABLE II.—*Ordinary Hospital Milk.*

	Bacteria per c.cm.		Bacteria per c.cm.	
	From churn.	After pasteurisation ("flash").	From churn.	After pasteurisation ("flash").
1924			1927.	
July	14,000,000	4,240,000*	May 28,500,000 ..	6,000
Aug.	18,500,000 ..	300	July 19,650,000 ..	39,000
Oct.	200,000 ..	100	Aug. 1,150,000 ..	20,000
Dec.	300,000,000 ..	220	Sept. 130,000 ..	750
1925			Oct. 13,000,000 ..	235,000
June	199,000 ..	840	,, 72,000 ..	1,100
1926.			1928.	
Sept.	565,000,000 ..	3,400	Jan. 265,000 ..	100
,,	9 000,000 ..	21,000	Feb. 35,000 ..	1,500
1927.			April 160,000 ..	3,450
Jan.	2,300,000 ..	5,600	May 440,000 ..	65
April	135,000,000 ..	1,670	July 33,000 ..	600
			Sept. 20,000,000 ..	1,500
			,, 3,250,000 ..	150

* Pasteuriser thereafter modified and readjusted.

The Ministry of Health definition of pasteurisation is "the retention of milk at a temperature of not less than 145°F. and not more than 150° F. for at least half an hour and then immediate cooling to a temperature of not more than 55° F., the milk being heated once only and not otherwise treated by heat." This is a description of the "holding" method as practised by most of the large dairy companies. The hospital pasteuriser was worked on the "flash" principle in which the milk was rapidly heated to 160°–165° F. in a space of about four minutes and then quickly cooled to 40°–45° F. by flowing over water- and brine-cooled pipes. We have been unable to detect any alteration in taste or character of the milk so pasteurised, and in view of our bacteriological findings on milk pasteurised by the "holding" method (Tables III. and IV.) we submit that the

TABLE III.—"*Pasteurised*" *Milk supplied to the Hospital.*

	Bacteria per c.cm.		Bacteria per c.cm.
1926.		1929.	
March	62,500	April	177,500
May	28,300,000	Aug.	64,850
Aug.	20,000,000		
Sept.	314,000,000	1930.	
Oct.	390,000	May	5,100
1927		July	500,000
Nov.	66,200	1931.	
1928.		Feb.	61,250
Nov.	29,000	May	727,500

"flash" principle is the better method. We do not condemn the "holding" method, but we consider it is very liable to fail on occasions which are not easy definitely to foresee for reasons which we shall presently state. It is quite evident that if a milk of good nutritive value is obtained pasteurisation efficiently carried out provides a method of rendering the milk clean and wholesome.

PASTEURISED MILK.

The samples of this type of milk have been mainly that sold to the hospital as "pasteurised milk" (Table III.), that is, milk which under the Milk (Special Designations) Order should not contain more than 100,000 organisms per c.cm. During the warm months, May–September, these samples have often had a bacterial content of several millions.

This fact was further brought home to us by the finding of many millions of viable organisms per cubic centimetre in some samples of "pasteurised milk" sent to us for analysis by the Medical Officer of Health of Islington in the summer of 1928 (Table IV.). It may be said without prejudice that these samples came from a retail shop of a large

TABLE IV.—*Pasteurised Milk.*

—	Source.	Bateria per c.cm.
1928.		
July.	Dairy X, Islington.	156,000,000
,,	,, ,, ,,	126,000,000
,,	Dairy X, Direct.	1,088,000,000
,,	,, ,, ,,	876,000,000
Aug.	Dairy X, Hounslow.	1,082,000,000
Sept.	,, ,, ,,	506,000,000
,,	Dairy Y, Marylebone	2,400
1931.		
May	,, Z, Paddington.	290,000

firm of dairymen whose pasteurising plant is the most up to date in the world; a firm who make every effort to supply the public with clean and wholesome milk and who employ a staff of highly trained bacteriologists and chemists to assist them in so doing. The result of our analysis came as a bombshell to the dairy company, but they gave us every opportunity to confirm our findings with other samples both from their retail depôts and from their pasteurising centres. This we were able to do (Table IV.), though the bacteriologists of the company were, with parallel samples, getting results which were well within the legal limit. There was naturally considerable discussion, entirely amicable, to account for the discrepancies in the parallel examinations, which resulted in considerable instruction to ourselves and them. The discrepancies were traced to a difference in the technique of the examination, and the high bacterial counts were found to be due mainly to heat-resisting bacteria.

Technique of Examination.

Our usual technique for the hospital milk analysis has been the making of ten-fold dilutions of the sample in sterile saline, ensuring proper mixing by shaking the dilutions in glass-stoppered bottles. The dilutions have been plated in ordinary agar and in litmus-lactose agar, both made from meat broth. On the other hand, the Ministry of Health circular, though recommending the making of dilutions in essentially the same manner, instructs the bacteriologists to plate out in agar medium made from peptone water and lemco. The formulæ of the three media are appended for comparison:—

	Ordinary agar.	Litmus-lactose agar.	M. of H. agar.
Water	—	—	1000 c.cm.
Meat extract ..	1000 c.cm.	1000 c.cm.	—
Peptone	10 g.	10 g.	3 g.
Sodium chloride ..	5 g.	5 g.	—
Lemco	—	—	3 g.
Lactose	—	10 g.	—
Agar	20 gr.	20 g.	15 gr.

It was very evident that the discrepancies between our results and those of the dairy company were due to the richness of our medium as compared with the poor nutrient value of that recommended by the Ministry of Health. Table V. shows the comparative results of two samples using the three media. The results, which are typical examples of several analyses, show firstly that our two media both detect more viable bacteria than the medium of the Ministry of Health and, secondly, that on some occasions the litmus-lactose agar is definitely

superior to ordinary agar. The significance of this we shall discuss later.

The moral of the results is clear. That though it is highly desirable that the Ministry of Health should lay down a standard technique in order that results may be comparable, it is wrong that that technique should involve the use of a medium of so poor a quality that it does not give any indication of the content of *viable* bacteria though the content is limited by law to 100,000 per c.cm.

TABLE V.—*Pasteurised Milk.*

Sample.	Bacteria per c.cm. using various media.		
	Ordinary agar.	Litmus-lactose agar.	M. of H. agar.
1	20,000,000	24,000,000	5,000
2	8,000,000	36,000,000*	76,000

* Excess growth on litmus-lactose-agar due to thermoduric streptococcus.

SIGNIFICANCE OF ORGANISMS GROWN ON RICHER MEDIA.

On the richer media we obtained heavier growths of all organisms that appeared on Ministry of Health medium. In addition, there were two organisms which we were unable to detect on Ministry of Health medium. It may be said with confidence that the additional organisms did not have the slightest pathogenic significance but, on the other hand, one at any rate was of some economic importance for it was a short-chained streptococcus capable of fermenting lactose.

Briefly the organisms were of two main types:

(1) *Bacillus.*—A thin Gram-positive non-sporing bacillus belonging to the group known as thermophiles. It was capable of slow growth in agar at 37° C. and appeared as minute pin-point colonies detectable with a hand-lens. These colonies, if subcultivated on to agar slopes, grew profusely when incubated in a water-bath at 56° C. These were definite thermophiles, as described by Ayres and Johnson [2] the optimum temperature for which is said to be 47° C.–63° C., and were detectable in both agar and litmus-lactose agar. They had no fermentative power, they were found in the hot summer months and have been fairly thoroughly investigated in America. If once implanted into a pasteurising plant of the "holding" type they are liable to be a chronic nuisance.

(2) *Streptococcus.*—A short-chained streptococcus, often diplococcal, appearing as very small fusiform colonies particularly in litmus-lactose agar and easily detectable on account of the small surrounding zone of fermentation. This organism was not thermophilic but was definitely thermoduric, for it resisted immersion in a water-bath at 60° C. for one hour. This organism was also found in the summer months and successful cultivation was very definitely favoured by the presence of lactose in the medium. It is fair to infer that the lactose of milk favours the multiplication of this organism and that the Ministry of Health medium fails to detect the fact.

Discussion.

We have furnished sufficient evidence to show that milk pasteurised in large quantity by the "holding" method often contains more viable bacteria than the Ministry of Health will allow, but that the determination of this fact is not possible by using the methods advocated by the same authority. We strongly advocate that richer medium should be used for routine analyses. Our experience (e.g., Table I.) shows that provided the sample of milk is clean, the richer medium still gives results within the present legal standards. The dairy companies themselves are aware of the difficulties of dealing with thermophilic and thermoduric organisms and they do their utmost to eliminate the trouble, yet their "official" bacteriological examinations show that their methods of pasteurisation are sound. It is the dairy companies who have discovered that trouble with thermophilic bacteria is seasonal; that "foaming" and "pocketing" of the milk during passage through the numerous pipes favour the multiplication of thermophiles; that the use of a pasteurising plant for a consecutive period of more than four hours causes a great increase in thermophiles; that a breakdown in the plant causing delay or prolongation of the time of pasteurisation ("overholding") has the same effect. Thermoduric and thermophilic bacteria are very liable to be implanted in a pasteuriser when milk that has been previously heated is mixed with unpasteurised milk and the whole mixture then pasteurised—a process known as "seeding." The trouble would appear to be not so much with the dairy companies who are aware of a good many of the troubles that may be caused in the plant, but with the unscrupulous farmer, who to cover his dirty methods, heats the milk before sending it to be pooled with the rest of the dairy company's supply. This is the probable cause of the results given by two analyses which the dairy company asked us to make with our media—an analysis of the raw milk and then of the same milk as it appeared sealed and bottled at the other end of the pasteurising plant. The samples had more viable bacteria after pasteurisation than before (Table VI.).

TABLE VI.—*Milk from Pasteurising Centre of Dairy Company.*

Sample.	Bacteria per c.cm.	
	Raw milk.	Pasteurised milk.
1	632,000,000	1,088,000,000
2	7,000,000	24,000,000

There can be little doubt that large scale pasteurisation by the "holding" method does not always achieve the reduction of bacterial content which the Ministry of Health desire. And as it is probable that the blame for this failure does not rest with the dairy companies, there is provided another incentive for a closer control and supervision of the farmer with a view to stimulating him to attain a high standard of cleanliness and quality. Pasteurisation as generally used at present is not the last word in the provision of clean and wholesome milk.

SUMMARY.

(1) Bacteriological control of milk-supplies is an adequate control of purity if the analysis is properly performed. Control must be continuous and not intermittent. (2) Only by the use of media capable of growing delicate micro-organisms can a proper bacteriological control of milk be made. (3) The present method of analysis advocated by the Ministry of Health does not detect all viable bacteria. (4) Pasteurisation by the "holding" method is liable to fail with regard to killing thermophilic and thermoduric bacteria. (5) The "flash" method of pasteurisation

is less open to the above objection and at the temperature used (160°–165° F.) is not only efficient but produced no detrimental change in the milk. (6) Comments on the probable origin and the significance of the more important thermophilic and thermoduric bacteria.

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MEDICINE AND THE LAW.

The End of the Jury of Matrons.

PARLIAMENT has at last abolished the jury of matrons as a part of our criminal law. The use of such a jury, to decide whether a woman convicted of a capital offence is pregnant or not, is of great antiquity, dating from times when medical science was non-existent or at any rate not commonly available. Had the occasions for its use been of greater frequency or publicity, its existence could hardly have been tolerated so long. Thirty years ago, the late Sir Harry Poland expressed the general view that the jury of matrons should be abolished, "but who," he added, "dare propose such an interference with the rights of women?" The answer is that the initiative has come from a woman Member of Parliament, representing a large proportion of women electors.

The Sentence of Death (Expectant Mothers) Act, which has now effected this reform, is strangely named, for it abolishes the death sentence where an expectant mother is convicted, penal servitude for life being substituted. It has long been the law that a pregnant woman should not be executed; the new statute saves her from a meaningless sentence. The change in the method of deciding the question of pregnancy is a more substantial matter. Formerly, the judge directed the immediate impanelling of a jury of twelve matrons or "discreet women" to answer the question. They were chosen *de mulieribus circumstantibus*, and, to prevent evasion of the duty, he would order the doors of the court to be shut. Unseemly scenes have been witnessed when women of a former generation, unused to any kind of jury service, scrambled to escape. It used to be said, indeed, that the attendance of feminine spectators at the Old Bailey diminished for a long time after such an incident at the trial of Katherine Webster in 1879. This ancient method of ascertaining pregnancy was far from infallible. In 1847, for instance, Mary Ann Hunt was convicted of murder in London. At the next session a jury of matrons was impanelled to try whether she was "with child of a quick child"; the matrons searched and examined and gave their verdict in the negative. She was left for execution, but the surgeon at Newgate reported to the Home Secretary to the contrary. The latter, showing, as Sir Harry Poland used to say, wisdom not less than that of Solomon, declared that a few months would settle the question. A few months later the child was born.

The new method of deciding the question of pregnancy is remarkable. Obsessed with the preservation of the ancient forms of British justice, Parliament has now entrusted the decision to the trial jury, who need not be resworn for the purpose. If there is no trial jury, or if the trial jury has disagreed on the question, a new jury is to be sworn specially for the purpose. Finally the woman has a right of appeal from the jury's verdict that she is not pregnant. All this is cumbersome and otiose. Is it really necessary to detain twelve jurors from their everyday work to undertake this investigation? Need the time of the Court of Criminal Appeal be occupied with such appeals? The evidence is bound to be medical in character; it could perfectly well be obtained directly by the judge from medical practitioners. It does not seem to have occurred to Parliament or the Home Office that the Irish precedent was preferable. More than fifty years ago the Juries Procedure (Ireland) Act provided that "the court shall direct that one or more medical men be sworn to inquire whether she be with child of a quick child"; if, after due inquiry, he or they report in the affirmative, "the court must stay execution till the woman is delivered of the child or until it is no longer possible in the course of nature that she shall be so delivered." Common sense might have suggested the application of some such machinery for the purposes of the new Act in England.

Cancer and Chiropractic Treatment.

An inquest was recently held at Bath upon the death of a retired Indian Army officer, aged 58, who had suffered from cancer of the prostate. Dr. Alister Sutherland gave evidence that the state of cancer was inoperable when first seen and that life could not have been prolonged for more than six months or a year. The deceased underwent chiropractic treatment in spite of Dr. Sutherland's warning that any severe manipulation of the spine would be dangerous; he became rapidly and progressively worse after the treatment. An X ray photograph taken at an earlier stage showed no evidence of spinal fracture or disease; another taken after the chiropractic treatment showed definite evidence of a fracture of the vertebræ. A woman chiropractor who had given the treatment stated that she had graduated in America in 1913 and had practised in spinal work. She examined the deceased and picked out the vertebræ which were slightly out of alignment; these, she said, by pressing on the nerves, caused pain. It was her duty to get rid of this pressure and so relieve the pain. It was not a severe treatment. Asked by the coroner to describe it, she said it consisted of a little short thrust; it was not a long manipulation. The deceased told Dr. Sutherland that the chiropractic treatment had relieved a certain number of his pains, and that, as the doctors had no alternative to offer, he was going on with it. He had told the chiropractor that he had been in the hands of the doctors and was getting steadily worse. He visited her three times, she stated, and he said he was improved each time. A verdict was returned of death from cancer of the prostate gland accelerated by a fracture of the spine.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

THE GERMAN AERZTETAG.

THE Aerztevereins-Bund and the Hartmannbund, which are two distinct but closely associated bodies, have just held a joint annual meeting in Cologne. The importance of this year's meeting was emphasised by the fact that the Government was represented by the Minister of the Interior, Dr. Wirth. In his address he pointed out that owing to the financial stress it had been necessary to diminish the sum allocated in the national budget for social insurance.

This was unfortunately bound to affect the medical profession. The first subject of discussion at the meeting was the reform of the laws governing medical practice. The regulations relating to medical practice have since 1867 been included in the laws concerned with trades (Gewerbeordnung), and this connexion has been greatly resented by the profession. The discussion was opened by a lawyer, Prof. Ebermayer, formerly director of public prosecutions, who said the medical man was not in any sense a tradesman, but was an officer of public health. The conditions of medical practice differ in all respects from those of a trade. One of the provisions needing adjustment was that whereby a medical qualification could be withdrawn for good only if obtained in a fraudulent way and could be withdrawn temporarily only if a medical man had been found guilty of a crime and punished with a temporary loss of civic rights. The chairman, Dr. Stauder of Nürnberg, spoke on the future organisation of the profession. He looked forward to the time when the medical chambers, which are State organisations with disciplinary powers, would be brought into closer connexion with the voluntary organisations of the profession such as the Aerzteverein and the Hartmannbund. He protested against the last emergency ordinance whereby the profession was fettered in an intolerable way in its association with health insurance work and whereby the younger generation of medical men was excluded from that work for a considerable time after qualification. Other items discussed included the influence of unemployment on the public health in general, the reform of the insurance laws, and the question of post-graduate study. The meeting considered the use of asphyxiating substances and of bacteria in a future war and the protection of the population against such attacks. The Government was invited to take steps towards convening an international congress to stop the manufacture of such war materials.

DEATH OF PROF. MINKOWSKI.

Prof. Minkowski, one of the most celebrated physicians and pathologists of Germany, died in Wiesbaden on June 16th. Born in Kowno (Lithuania), in 1858, he became privat-docent in Königsberg at the age of 27 and six years later extraordinary professor in Strassburg. In 1900 he was appointed chief physician to the Cologne General Hospital and professor in the Academy of Medicine of that city, which has now become a faculty of the local university. Later he was appointed to the chair of medicine at Greifswald and then was invited to Breslau to succeed the late Prof. Strümpell. Prof. Minkowski's work was of fundamental importance, especially in connexion with diabetes. In 1884 he detected the presence of oxybutyric acid in the urine of diabetic patients, and formed the view that diabetic coma was due to an acid intoxication of the blood. He discovered later the part played by the pancreas in diabetes. Finding that after removing the pancreas of dogs sugar was present in their urine, he came to the conclusion that pancreas must contain the substance necessary for the decomposition of carbohydrates and that its absence must thus lead to the excretion of sugar. His experiments thus formed the basis of the complex work on carbohydrate metabolism which eventually led to the discovery of insulin. Prof. Minkowski also worked on the pathology of gout, liver diseases, and diseases of the respiratory organs. During the war he turned his attention to the study of the morbid condition caused by gas poisoning. He had a large practice as a consultant in Breslau until he retired in 1926 to spend the rest of his life in Wiesbaden.

AN ACTION FOR UNFAIR COMPETITION.

Dr. Neustätter, the head of the anti-quackery department of the Dresden Exhibition of Hygiene held this summer, allowed the exhibition of a poster showing a man, who had run astray by following sign-posts leading to certain quack remedies, eventually finding his way back on to the road of scientific medicine. The producers of certain compounds mentioned in the picture brought an action against Dr. Neustätter before a court in Dresden for unfair competition and Dr. Neustätter was ordered to pay damages to the plaintiffs. In the judgment the court stated that Dr. Neustätter's picture was designed to induce patients to abstain from using the compounds mentioned instead of consulting qualified medical men and that the exhibition of the poster must thus be regarded as unfair competition. The Berlin Medical Society lately discussed the judgment. The chairman, Prof. Goldscheider, recalled the fact that 60 years ago the society had successfully petitioned for the abolition of the anti-quackery laws in the belief that the public was reasonable enough to decline to use quack medicines without legal restrictions being required. Its members had, however, been greatly disappointed. The Dresden judgment had proved this view to be untenable. The society finally adopted a motion that the exhibition of the poster was not inspired by commercial motives but by the wish to serve the public health. By wrongly interpreting the purposes of the exhibit the Dresden court had, it was felt, struck a blow against the honour of the profession. It was the duty of the profession to fight an unscientific outlook and attempts in this direction could not be regarded as unfair competition.

THE LÜBECK TRIAL.

The trial of the Lübeck medical men on a charge of manslaughter by negligence in the application of the Calmette treatment will take place in October. This is the biggest trial on record in Lübeck, since the public prosecutor is backed up by all the 250 parents of the children who died or were damaged in health after receiving treatment in the spring of 1930. A large number of witnesses will be summoned by the defence and by the prosecution, including Prof. Calmette, who has declared his readiness to appear before the court.

AN INTERESTING LAW-SUIT.

The question whether a medical man is entitled to charge for attendance on his wife was lately decided by the High Court in Leipzig. The wife of a medical man had been run down by a motor-car and severely injured. She was attended by her husband and in due course sent the owner of the car a note of her expenses, including accounts for medical attendance. The owner of the car declined to pay the doctor's bill, because he considered him obliged to attend members of his family free of charge. The High Court found against this view. In the judgment it was stated that one who has injured the health of a person cannot decline his financial responsibility under the pretext that the injured person had had no expenses because she was attended by her husband, who must be supposed to attend her free of charge. Such attendance not only requires time which the medical man might have spent on other patients, but also the use of medical instruments and of dressing materials. The defendant had thus to pay the sum charged by the medical man.

A NEW HOSPITAL IN BERLIN.

A new hospital, called the Martin Luther Hospital, was recently opened in Berlin. It has been erected

on behalf of the Lutheran Church and contains 450 beds. Its principal feature is that it has seven floors, whilst in Berlin formerly single-floor buildings were preferred for hospitals. The wards do not contain more than six beds each, whereas in public hospitals the wards contain up to 30 beds. The patients will thus enjoy more privacy and quiet than those in hospitals with large wards. There are six operation rooms, a lying-in room, rooms for special treatment, a radiographic and hydrotherapeutic department, and a post-mortem room. A nurse's training school is connected with the hospital.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

THE POPULATION PROBLEM.

IN the May number of the *Indian Medical Gazette* attention is drawn to the progressive increase in population which each succeeding census records. Since the British occupation it has grown by a hundred millions, and the first returns of the present census indicate relatively greater proportionate increase during the last decade, Bengal showing a gain of 7 per cent. Even at present the produce of the land cannot maintain the inhabitants in an efficient state of nutrition. Little arithmetic and less imagination are required to forecast the state of affairs a hundred years hence if this rate of increase continues unchecked. Overcrowding must become critical long before that, in spite of irrigation, improved methods of agriculture, and other alleviating agencies, unless some counter-vailing influences not at present in action can be brought to bear. Curiously enough, this reflection is prompted by the reiterated demand of the annual conference of research workers, for more active measures of research, and prevention of disease. Already disease has been controlled to a considerable extent, the effects of famine much mitigated, and wars on any considerable scale in the country itself have been avoided for a long period. If all these factors persist or are intensified, what becomes of the balance between food-supply and population? Delayed marriage and contraception are said to have a restraining influence and certainly there is plenty of room for a change in the direction of later child-bearing. Birth control is only applicable to educated and intelligent sections of the community, but advanced Indian opinion is evidently trending that way, in some quarters. In Madras a "Neo-Malthusian League" has already been formed.

INDIGENOUS DRUGS.

Though they have not revealed much in the way of new specific remedies, the past few years' investigations of native drugs have led to a considerable accumulation of knowledge of the medicinal plants which India produces. Lieut.-Col. Chopra, who has been responsible for much of the research work in Calcutta, says that about three-quarters of the vegetable drugs of the British and U.S. pharmacopœias grow in India. The Himalayan valleys from Kashmir to Sikkim form the chief nurseries, but the Kumaon hills and Vindhya range in the north, and the Nilgiris in the south, also abound with medicinal plants and herbs, some of which grow wild, while others are cultivated. In many cases, where the actual official varieties do not exist, there are others belonging to allied species which possess similar properties, and are capable of being utilised as substitutes. They would, of course, have to be examined and standardised, and this work is already in progress. It is remarkable that the manufacture of drugs on scientific lines, and of surgical dressings, has hitherto been almost entirely neglected in India. With few exceptions, such as quinine and castor oil, nearly all the pharmaceutical and surgical requirements of the country are imported from Europe and America. Here is a very reasonable opening for *swadeshi* activities.

THE ANTIQUITY OF SYPHILIS.

There has recently been a tendency to try to ascribe the introduction of syphilis into India to evil communications from the West. It is therefore instructive to find Dr. Chenoy, in an article in the *Antiseptic*, identifying an unmistakable account of the disease in the ancient Hindu scriptures. The Ayurveda, he says, contains several passages bearing on the subject. Infection is ascribed to the sexual act. There is a clear account of secondary symptoms, such as condylomata and mucous patches at the genital organs and mouth, and superficial ulcers in various situations, and the depression of the nose and perforations of the palate characteristic of tertiary lesions are also mentioned. The disease is spoken of as the shameful disease, and reference is made to round ulcers, prominent pustules, alterations of the nails, buboes, and alopecia, as well as stricture of the anus. The Ayurveda dates back to a period perhaps 1000 years B.C. Dr. Chenoy concludes that syphilis existed in India, and probably elsewhere, in prehistoric times, and is evidently one of the most ancient diseases of man.

MR. GANDHI AND FOREIGN MISSIONARIES.

Alluding to recent reports in the press that he was hostile to foreign missions, and would like the missionaries to withdraw from India, Mr. Gandhi, writing in his paper *Young India*, now corrects and amplifies the statements attributed to him, as follows:—

"I hold that proselytising under the cloak of humanitarian work is, to say the least, unhealthy. It is most certainly resented by the people here. Religion after all is a deeply personal matter, it touches the heart. Why should I change my religion because a doctor who professes Christianity as his religion has cured me of some disease, or why should the doctor expect or suggest such a change whilst I am under his influence? Is not medical relief its own reward and satisfaction? Or why should I whilst I am in a missionary educational institution have Christian teaching thrust upon me? In my opinion these practices are not uplifting, and give rise to suspicion if not even secret hostility."

It does not appear that Mr. Gandhi has any special prejudice against Christianity as such. It is thought, in fact, that his ideas on religious subjects have been much influenced by the New Testament, as he undoubtedly has in social problems by the teaching of Ruskin.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—A quarterly court of directors was held on July 8th, with Dr. W. Culver James, senior vice-president, in the chair. The death of an annuitant was reported, who had been in receipt of grants since 1920, and had received £787. Her late husband had paid in subscriptions about £52. Sums amounting to £2075 were voted for the half-yearly grants to the 52 widows and 7 orphans on the books of the society, and £123 was voted as special grants for six orphans, in order to enable them to continue their education after the age of 16, when the ordinary grants cease. Full particulars of the society and its benefits may be had from the secretary at 11, Chandos-street, Cavendish-square, W.1. An account will also be found in THE LANCET of April 11th (p. 817).

REVISION OF THE PHARMACOPŒIA.

RECOMMENDATIONS OF PHARMACY SUBCOMMITTEE.[1]

THE publication of their second report completes the work allocated to the Pharmacy Subcommittee. In issuing it the Pharmacopœia Commission record appreciation of the criticisms and suggestions made in connexion with the first report of the subcommittee, and their hope that this report will also give rise to comments, to which careful consideration will be given. The following examples show signs that the subcommittee appreciate suggestions and are willing to alter their tentative recommendations on adequate grounds.

Liniments, Ointments, and Plasters.—At an early stage of their work the subcommittee were informed that olive oil of high grade would be described in the new Pharmacopœia, and the suggestion was made that the use of a cheaper oil should be permitted in making liniments, ointments, and plasters. The proposal, made in the first report of the subcommittee, that cottonseed oil should be used for this purpose, has been adversely criticised, more particularly in relation to liniment of camphor. The subcommittee now make the suggestion that the Pharmacopœia should recognise, in addition to the high-grade olive oil, an olive oil of lower quality, which might be used in making the official liniments, ointments, and plasters. The case would be met by appending to the monograph on olive oil a note to the following effect:—"Olive oil conforming to the above characters and tests, but possessing an acid value not exceeding 6·0, may be employed in making the official liniments, ointments, and plasters for which olive oil is directed to be used."

Eye Ointments.—The subcommittee have been asked to devise formulæ for a number of eye ointments for inclusion in the new Pharmacopœia under the name "Oculenta." They submit a description of a general process to be followed in making eye ointments, with a list of the suitable strengths of various drugs commonly employed in this form.

Hydrargyrum cum Creta.—The attention of the subcommittee was drawn to some experiments which showed that mercury with chalk made according to the formula of the present Pharmacopœia rapidly developed considerable quantities of soluble mercuric compounds on keeping. It has been found that mercury with chalk containing dextrose develops soluble mercuric compounds less quickly. If a large proportion of dextrose is used the mercury is liable to separate when the mercury with chalk is made into a pill-mass. The proposed formula is mercury 330 g., dextrose 100 g., chalk 570 g., triturated together in a porcelain mortar until the mixture acquires a uniform pale grey colour and metallic globules cease to be visible when examined under a lens magnifying four diameters.

Liquor Adrenalinæ Hydrochloridi.—The use of chloroform as a preservative in this solution has been criticised and the subcommittee recommend that chlorbutol be substituted for it.

Liquor Sodæ Chlorinatæ Chirurgicalis.—In dealing with Dakin's solution, the task before the subcommittee was to devise a formula for the preparation of a solution which would contain a standard proportion of available chlorine and would be free from excessive alkalinity. As the solution undergoes decomposition on keeping and is often required at short notice, it was thought desirable to draw up the formula in such a way that the solution could be prepared extemporaneously from standard materials, and dispensed without analysis and adjustment. Chlorinated lime, when stored under proper conditions, may be kept for a considerable period without decomposition. The formula given would enable the pharmacist to keep a supply of chlorinated lime of known content of available chlorine, and to dispense Dakin's solution, as required, without further analysis.

Syrupus Ferri Phosphatis cum Quinina et Strychnina.—The subcommittee have conducted a long series of experiments in the endeavour to improve the keeping properties of this syrup. The most satisfactory result, so far obtained, has been secured by the replacing of part of the syrup by glycerin.

This report deals also with the preparation of collodion, extracts and liquid extracts (including liver extracts), and infusions, injections, tinctures, suppositories, syrups, and other substances used in pharmacy.

A report (No. 7) has also been issued by the subcommittee on ampoule glass (price 1s.).

[1] General Medical Council. Pharmacopœia Commission. Reports of Subcommittees No. 6. Published by authority of the General Medical Council, 44, Hallam-street, London, W. 1931. Pp. 24. 1s. 6d.

PANEL AND CONTRACT PRACTICE

EXCESSIVE SICKNESS CLAIMS.

COMMENT on the growth of sickness and disablement claims was made by Mr. A. S. Comyns Carr, K.C., in his recent presidential address to the Association of Approved Societies, reported in the *National Insurance Gazette* for July 4th. He pointed out that there was little evidence of a large increase of sickness among the population, which might explain the rise of claims. A factor which could not be left out of consideration, he said, was that the increase of facilities for medical examination had brought to light claims in respect of complaints which some years ago would have been, at any rate temporarily, overlooked, although they might in the long run result in serious consequences for want of early attention. He was afraid, however, that there remained a considerable body of evidence that there were a number of people who put in claims which they would not have felt justified in putting in some years ago. The corollary, he said, seems to be that there is a considerable body of medical practitioners who are not so careful with regard to the certificates they give as they were some years ago.

"Is it really true," continued Mr. Comyns Carr, "that there are medical practitioners who will grant certificates to people not entitled to them, and, if so, how can it be prevented? Is it a fact that medical practitioners are genuinely taking a broader view of the degree of sickness which warrants a man or a woman staying away from work? It may be quite true that by allowing claims at an earlier stage of illness you are, I do not say reducing the ultimate burden on the fund, but at all events tending to keep alive with a reasonable chance of good health a number of people who otherwise might be overwhelmed by sickness which is to some extent curable or preventable. There is a good deal of suspicion that there are a number of doctors who are prepared to certify people who they know ought not to be certified and to certify people who they know ought to be back at work, if there is work to go back to, and who do it partly by allowing their hearts to get the better of their heads, and partly for fear that if they do not grant certificates the insured persons concerned will transfer themselves to the panels of other doctors who will do it. In so far as there is any foundation for the latter suspicion, which is very widely held, it is very important that steps should be taken to put a stop to it.

"Whether the best means is to limit much more strictly than at present the right of an insured person to transfer from one doctor to another, or whether there should be a much closer supervision exercised, chiefly by the approved societies, over the claims which come in from doctors whom there is reason to suspect, with a view to the removal of such individuals from the panel, I am not sure. I think the latter method would be more effective than the former. There is much to be said against the restriction of the right of transfer, but there is nothing to be said against the infliction of severe penalties on medical men who, without reasonable excuse, certify people who should not be certified. This applies also to regional medical officers."

INSURANCE PRACTITIONERS' RECORDS IN SCOTLAND.

In an address to the Scottish Conference of Friendly and Approved Societies, Mr. John Jeffrey, Secretary of the Department of Health for Scotland, said that recently the Department had been criticised for asking insurance practitioners to furnish certain

information as to cases sent to the in-patient or out-patient departments of hospitals. But the criticism was based on a misunderstanding. The capitation fee to insurance practitioners included a payment for certain records to be kept by them. Until recently these records were two in number. Instead of requiring a daily record of visits and attendances for insured persons, as was kept by all English practitioners, the Department, after consultation with representatives of the British Medical Association, and with their concurrence, resolved to introduce a scheme whereby insurance practitioners would be given an opportunity of helping in clinical and administrative investigations. Their aim was to link up the insurance practitioner with research. The obligation to supply information in connexion with these investigations had taken the place of the obligation to send in annual summary cards. The insurance practitioners' part was to supply on a form a report on patients for whom they sought in-patient or out-patient treatment. He was satisfied that a doctor, even in a busy industrial area with a panel of 1500 persons, would not, on the average, require to send to the Department two reports a week. Surely it would be agreed that the insurance practitioners' part in this valuable investigation did not involve a serious encroachment on his time. Moreover, it was work undertaken as part of his agreement, and he was being paid for it.

Morbidity statistics had been collected for almost a year, and he said they hoped to publish a special report which would discuss more fully than had already been done some of the conclusions that might be drawn from the statistics. This would be the first report to be issued in this country dealing with sickness among the insured population. They had also nearly completed the first of what they hoped would be a series of investigations into the sickness experience of particular occupational groups of workers. Among other problems which had been already thrown up by the morbidity statistics he might cite the following: Why should a married woman require six days longer on an average than a single woman to recover from an illness? Why should the average duration of incapacity in the more isolated areas of the country be very much longer than it is in the more populous centres? What is the reason why, in one particular case of a fairly large panel, there should be a certification rate of 25 per cent. of the number of the panel during six months?

Mr. Jeffrey added that the increasing burden on women's funds had given rise to the greatest anxiety.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of one county and three county boroughs:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Wiltshire .. (299,933)	15·2	11·3	0·61	1·66	0·9	2·6	51	—	—	3·2
Plymouth .. (199,000)	15·9	11·8	1·00	1·59	2·1	1·8	61	27	35	7·6
Sunderland .. (184,000)	23·1	13·5	1·36	1·14	2·7	2·0	78	34	41	3·8
Walsall .. (100,100)	20·6	11·2	1·11	1·14	1·8	2·1	69	35	20	5·3

Registered stillbirths per 100 live births:—Wiltshire 3·6, Plymouth, 5·3, Sunderland 4·0, Walsall, 3·3.

Wiltshire.

Dr. Claude E. Tangye states that the out-relief districts under the boards of guardians have been reduced in number by two. Formerly many of the applicants for relief called at the relieving officers' homes and there was one pay station at Swindon. Now payments of relief are made in the applicants' homes. The public assistance institutions for the chronic sick number 13, at three of which accommodation is provided for mental defectives, and at one of which there are wards for difficult male cases under male attendants. The services of consultants can be obtained both for institutional and home-treated cases. The hospital provision has been very fully used during the year and there is no serious shortage of general hospital beds apart from the Swindon area. The Pewsey poor-law institution is to form the nucleus of a mental deficiency colony with accommodation, ultimately, for 600. Notice has been received from outside authorities that the cases accommodated outside the county can be no longer retained. At present there are 84 males and 108 females in outside institutions. Since the Housing (Rural Workers) Act came into operation in January, 1927, 181 applications for grants or loans have been received by the county council, 31 of which were made during 1930. At the end of 1930, £6452 had been paid in respect of 77 houses, and work on 25 other houses had been begun. The Housing Act of 1930 puts new duties on the county council, and every rural district council must furnish information on overcrowding and unsatisfactory conditions, and the steps being taken to ascertain them. Dr. Tangye regrets that so far very few rural district councils have furnished this information. The Act enables the county council to make contributions to rural district councils for housing the agricultural population.

Outside Swindon the urban areas in the county retain their character of country towns and social conditions, and occupations are favourable to health. The district nursing associations cover the county area almost completely, and the county council, under the new Local Government Act, contribute towards midwifery, maternity nursing, and health visiting carried out by these associations. The handy woman has practically disappeared and almost all confinements are attended by midwives, either as such, or as maternity nurses. The standard of antenatal work carried out by midwives has shown a decided improvement, and the county council have approved a scheme for antenatal supervision by the family doctor, who is to attend the confinement. There are five maternity homes used by the county council, the total admissions to which were 741. The net cost to the county council for the 253 cases sent in by them was £2 2*s.* 6*d.* per patient.

Hitherto the inspection of dairy herds has been confined to the follow-up of tuberculous milk samples complained of by outside authorities, but on Oct. 1st the part-time veterinary inspector, Mr. S. V. Galledge, was appointed on a full-time basis, and Dr. Tangye points out that systematic inspection of all dairy cows must be the eventual aim in this great dairy-farming county. An outbreak of trichiniasis associated with the consumption of uncooked pork in potted meat from a meat factory accounted for seven cases of acute illness. The patients all recovered, though some were gravely ill. Two cases of fatal

septic poisoning occurred at a dairy farm; both men were milkers. The first patient infected the teats of two cows and the second patient received the infection by milking these cows. The organism was a hæmolytic streptococcus. No harm resulted from the use of the milk, for it was sterilised at a factory.

Dr. Tangye wishes to see hospital treatment provided for measles and whooping-cough, with their high pneumonia fatality, rather than for the comparatively mild scarlet fever.

Plymouth.

Dr. A. T. Nankivell's report shows that Plymouth has in hand a big scheme of hospital reorganisation. There are three voluntary general hospitals with 240, 60, and 50 beds, respectively, and an eye infirmary with 28 beds. One of these general hospitals has recently absorbed the Eye, Nose and Throat Hospital and a scheme is in hand for the amalgamation of the three general hospitals, which will render classification of patients possible and, incidentally, facilitate negotiations between the voluntary and the municipal hospitals. Dr. Nankivell points out that there is no hard-and-fast line now between voluntary and municipal hospitals, and he hopes that the vague phrase "the Voluntary System," will not prove a formidable barrier in these negotiations for complete coöperation. In April, 1930, the municipality took over the three workhouses of the three towns. These were mixed workhouses of the old type. One of them—the Greenbank poor-law institution—has been transferred to the health committee and is to be converted into an up-to-date hospital. A medical superintendent and a complete visiting staff, paid by fees for services rendered (except in the case of the physicians), has been appointed. Before April last Greenbank was a workhouse holding 200 sick and infirm and a like number of able-bodied and lunatics; also some tramps, test workers, and all the mixture of the old workhouse. The able-bodied were transferred to the Devonport institution under the public assistance committee. The lunatics were sent either to Devonport or to the asylum, the tramps to the Stonehouse workhouse, and the children were passed over to the maternity and child welfare committee or the education committee, and during April all the poor-law sick from Stonehouse and Devonport were taken to this new city hospital. The buildings of the hospital were in a bad state of repair, and at the end of 1930 renovation was about half finished and accommodation for 550 patients available. Dr. Nankivell gives a graphic description of the want of equipment, human and otherwise, and of the wastage under the old régime. The central heating, at a cost of £4760 per annum, was doing very little work and most of the steam pipes leaked. During the last half of 1930 food cost £700 per annum less and the patients were better fed than ever before. The medical superintendent, Dr. Ivor Lewis, says there are now 23 maternity beds, and that it is hoped to develop antenatal work so as to form a consultative clinic for the practitioners and the maternity and child welfare officers. For this purpose out-patient accommodation is required. Medical out-relief under the old poor-law, which was working well, has come under the control of the health department. The principal change made is that the nine part-time practitioners are being asked to give prescriptions as under the National Health Insurance Act. The former dispensary has been closed and the new scheme has worked well since September.

Other municipal hospital developments are: Swilly Hospital, at present used mainly for tuberculosis, has been greatly extended at a cost of £47,000 and will be open during the current year as the isolation hospital; Mountgold Hospital, at present used for scarlet fever and diphtheria, will accommodate intermediate and advanced cases of pulmonary tuberculosis in men and women; on the high ground adjacent to Mountgold Hospital an orthopædic hospital is to be built to accommodate 120 patients; while Udal Torre Sanatorium, at Yelverton, an unsuitable building, is to be closed.

Dr. Nankivell complains of the slow progress made with slum clearance. Five years ago three slum areas were scheduled, and the city council readily agreed to their reconstruction. These areas should have been cleared three years ago, but nothing except some reconditioning has been done. There are other insanitary areas which need to be dealt with. During the next five years 2232 new houses should be built, and of these 1000 should be built as soon as possible. The lack of suitable sites retards progress in housing, and Dr. Nankivell thinks lofty blocks of modern flats on some of the insanitary areas in Stonehouse might be a desirable way of meeting the difficulty.

Sunderland.

Dr. A.S. Hebblethwaite states that on April 1st, 1930, Highfield poor-law institution was handed over to the public assistance committee, and that it has since been arranged that on April 1st, 1931, the medical, surgical, maternity, tuberculosis, and isolation wards and the nurses' home will be constituted a municipal hospital under the health committee. No changes have been made in the poor-law medical out-relief districts since their transference.

There are about 30,000 houses in the borough and 3600 people waiting for corporation houses. It is pointed out that the number on this list is not necessarily proof of great shortage, many applications being from persons who merely desire a change. The houses built during the year numbered 756, as compared with 410 in 1929. An increasing number of houses is being dealt with under Section 3 of the Act of 1925 and Section 17 of the Act of 1930. In 1928, 126 of these were renovated by the owner and 28 by the municipality in his default. In 1929 the figures were 317 and 55, and in 1930 647 and 44. The owners therefore show a decidedly increasing inclination to carry out the repairs themselves. The five-year housing programme puts forward ten clearance areas, involving 653 dwelling-houses and 6646 persons. The municipality expects to build 3000 new houses, of which 1000 will be needed to accommodate the population of the ten clearance areas and of additional individual houses to be demolished. The tuberculosis death-rate was exceptional in 1930 in that there were more deaths from non-pulmonary than from pulmonary tuberculosis, and Dr. Hebblethwaite points out that during the last five years there has been a definite decrease in tuberculosis of the lungs, but a definite increase in tuberculosis of the glands, bones, and joints. Dr. Eustace Thorp, who is in charge of the isolation hospital, expresses the opinion that the standard of the State examinations for nurses is far too high and covers too wide a scope. The long distances which nurses have to travel for their oral examinations is another matter requiring remedy.

Dr. Hebblethwaite advocates that general practitioners should have the use of the municipal antenatal clinics and staff at special sessions in order that the antenatal examination and the confinement may be conducted by the same person.

Walsall.

Dr. James A. M. Clark reports that the Manor Hospital and Beacon Lodge (poor-law), being a combined institution, has been placed under the control of the public assistance committee. The hospital contains 300 beds and the medical officer in charge reports that the work greatly increased during the year. For example, surgical operations numbered 85 in 1927, 369 in 1929, and 849 in 1930. The wards are now quite full and extensions are necessary.

The shortage in hospital beds in the borough appears to be general. The new isolation hospital, opened in April, provides only 34 beds. A slight outbreak of diphtheria in the second quarter was sufficient to show the inadequacy, and at the present time proposals for an additional ward block of 24 beds

and a block for tuberculosis are before the council. The new maternity hospital, opened in July, 1929, with 11 beds, has proved so popular that many applications had to be refused. Since this hospital was opened antenatal work at the clinics has shown a great increase.

There is a considerable amount of overcrowding, and the corporation propose to build 4000 houses during the next five years, besides houses for rehousing tenants from clearance areas. There are about 2000 small houses built about 60 to 100 years ago, many of which show extensive deterioration. One unhealthy area containing 177 houses, occupied by 935 persons, was represented at the end of the year, and inspections are proceeding with a view to the representation of other areas. About a quarter of the houses are supplied by outside standpipes, serving from two up to 12 houses. Of 16,956 water-closets, 5817 have no flushing cistern and have to be flushed from a bucket or other receptacle. These are being dealt with under Section 36 of the Public Health Act, 1875. By-laws for houses let in lodgings were approved in June and the Walsall Act of 1930 prohibits any tent, van, shed, &c., for human habitation to be placed on any site within the borough without the previous approval of the corporation.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 4TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 56; scarlet fever, 1442; diphtheria, 893; enteric fever, 63; pneumonia, 540; puerperal fever, 51; puerperal pyrexia, 100; cerebro-spinal fever, 39; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 24; dysentery, 13; and ophthalmia neonatorum, 107. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 7th–8th was as follows:—Small-pox, 97 under treatment, 1 under observation (last week 124 and 1 respectively); scarlet fever, 1111; diphtheria, 1433; enteric fever, 15; measles, 143; whooping-cough, 449; puerperal fever, 35 (plus 10 babies); encephalitis lethargica, 208; poliomyelitis, 2; "other diseases," 141. At St. Margaret's Hospital there were 11 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 (0) death from small-pox, 3 (0) from enteric fever, 16 (0) from measles, 3 (1) from scarlet fever, 21 (4) from whooping-cough, 23 (3) from diphtheria, 31 (7) from diarrhœa and enteritis under two years, and 19 (1) from influenza. The figures in parenthesis are those for London itself.

Three deaths from meningococcal meningitis were reported from London, all in children below five years of age. Three deaths from measles were notified in Leeds, while in Liverpool there were five deaths from whooping-cough, five from diphtheria, and three from diarrhœa and enteritis under two years.

The number of stillbirths notified during the week was 283 (corresponding to a rate of 42 per thousand births), including 46 in London.

DEATH CLASSIFIED TO SMALL-POX.

THE death from small-pox was assigned to Burton-upon-Trent. Dr. J. M. Cowie, the medical officer of health, kindly gives us the following particulars:—"The death certificate was signed as due to 'Variola.' The age of the patient was 75 years. He was probably vaccinated in infancy, but it was impossible to identify with certainty any vaccination marks. The case was a severe one, being of a confluent or semi-confluent character."

OBITUARY

SIR CHARLES HENRY BEDFORD, M.D., D.Sc., LL.D. Edin., I.M.S.

Lieut.-Colonel Sir Charles Bedford, who died on July 8th after a short illness, was the son of Dr. F. W. Bedford, headmaster of George Heriot's Hospital, Edinburgh. He wrote a biography of his father, and a history of the hospital, later advancing its interests in every way he could. A student of Edinburgh University, he graduated in medicine in 1887, in science in 1889, and after a couple of years in general practice joined the Indian Medical Service in 1889. He became professor of chemistry at Lahore and Calcutta, wrote "A Clinical Handbook of Urine Analysis" and a "Practical Chemistry" (their second editions being translated into French, Italian, and German), and became director of the Central Excise Laboratory for India and scientific adviser to the Government of India. He showed the Government that their standards for the taxation of alcoholic liquors were mistaken, recalculated the tables of alcoholic strength and specific gravities, and is said to have saved the revenue a million a year; he also edited for a time the *Indian Medical Gazette*. On retiring in 1911 he received a knighthood. The honorary degree of Doctor of Laws was conferred on him at St. Andrews in 1913, at Edinburgh in 1923, and at Oxford in 1924. During the war he acted as a regional chief commissioner of medical services; he was the first general manager of the Association of British Chemical Manufacturers, and hon. adviser to the Secretary of State for the Colonies on power and industrial alcohol. Later he did a great deal to encourage the foundation of the chair of Spanish studies at Oxford, and was director of the Anglo-Spanish and Spanish-American Institute of London. He was a Knight Grand Cross of the Order of Civil Merit. Sir Charles Bedford was twice married, but leaves no children.

ARTHUR MUSSEN, M.D. Q.U.I.

WE regret to announce the death of Dr. Arthur Mussen, at Templepatrick, in Northern Ireland, on July 3rd. Born at Hillhall, Lisburn, in 1842, he received his medical training in the Queen's College, Belfast, and graduated M.D. of the old Queen's University of Ireland in 1863. He also qualified as M.R.C.S.Eng., and was a licentiate of the Faculty of Physicians and Surgeons of Glasgow. He was one of the last surviving doctors in Ireland to have served a term of apprenticeship with a medical man in practice during his collegiate career. In 1865 he was appointed medical officer of the Glenavy dispensary district, and in that capacity discharged his duties with a faithfulness which gained for him the affection of the countryside. For 51 years he held the post of coroner for South Antrim, and was a Justice of the Peace for County Antrim. Dr. Mussen was prominently identified with the Orange Order, and for 57 years was District Master.

DAVID SOMERVILLE DOUGHTY, M.D. Edin.

Dr. Doughty, who died at Dalston, on July 10th, was born at Thornhill, Dumfries, in 1863, educated at Hutton Hall in the same county, and became in due course a medical student at the University of Edinburgh. After graduating in 1886, he began his medical career as house surgeon to the Dumfries Infirmary, spent a year as an assistant in London,

then practised for another year at Hesket Newmarket, in Cumberland. He eventually bought Sir Norman Walker's practice at Dalston, to which he was to devote the rest of his life. He retired from active work only a few weeks ago, owing to failing health. "Of Dr. Doughty, as a man and physician, it is difficult to speak too highly," writes a colleague. "He was the type of man eulogised by the Roman poet of old—'Integer vitæ scelerisque purus.' With a keen interest in his profession, and an abundant store of human sympathy, he was one of the finest specimens of the old-fashioned country doctor one could wish to meet. He had many and varied interests. He was not only a popular doctor; he was a keen follower of hounds, an ardent fisherman, and a first-class game shot. There was no project set on foot calculated to promote the happiness of his neighbours which had not his whole-hearted support. Amongst his other activities he was for many years chairman of the local panel committee of the National Insurance. The meetings of this body he conducted with rare acumen, while his genial good humour soon smoothed down any asperity arising in the course of the discussions."

Dr. Doughty was shortly to be presented with an illuminated address and a substantial testimonial from the people he had served for 42 years.

CORRESPONDENCE

RECOVERY FROM STREPTOCOCCAL SEPTICÆMIA.

To the Editor of THE LANCET.

SIR,—In their interesting report of a case in your last issue (p. 72) Dr. A. H. G. Burton and Dr. A. R. Balmain make certain references to a paper by myself and Dr. R. E. Smith (Guy's Hospital Reports, Jan., 1931) which, to give our findings their due, require expansion and explanation.

1. They state that out of 21 cases described by us only six recovered. They do not mention that these constituted a more serious group, including complicated cases (five of them already the victims of chronic disease) from hospital records, and that the parallel series from private practice showed a recovery-rate of six out of eight traced cases. In other words, there were 12 recoveries out of 29 cases in the whole series reported by us.

2. They state that we regard diarrhœa, albuminuria with red cells, rapidly progressive anæmia, and the smooth red desquamating tongue as diagnostic of a streptococcal infection with an hæmolytic strain, but that these symptoms were lacking in their case. We believe that this is a valuable diagnostic syndrome, but we have not suggested that it is present in every case or with every strain. They also emphasise the absence of rigor in their case. This symptom, so commonly regarded as of outstanding diagnostic importance in septicæmic states, was rare in our hospital series.

3. Although our results with serum treatment were, on a critical analysis, disappointing, we do not altogether condemn the method. Furthermore, we make a special point of suggesting the trial of various brands of serum, which Drs. Burton and Balmain also claim as reasonable and as having contributed to the recovery of their patient.

The real difficulty in these streptococcal fevers is to decide whether recovery has been *post* or *propter* the serum therapy. The most anxious cases may recover without serum therapy or many weeks after ineffectual serum therapy and in spite of serious complications such as Drs. Burton and Balmain describe. It is highly probable that the use of other types of sera was a factor in the recovery of their patient, but there is nothing conclusively in support of this in their clinical report as presented. One of our most striking recoveries followed treatment with combined polyvalent serum and scarlatinal antitoxin, but I should hesitate to claim that the recovery was directly due to it or that it could not have occurred without it.

I am in entire agreement with their plea for early blood-culture and for a fuller trial of treatment with various types of concentrated serum, but if we are really to advance our knowledge of serum therapy in acute bacterial diseases such as septicæmia and lobar pneumonia, the most careful study of the natural history and course and of the variable mortality of these diseases, and the most critical analysis of case-reports are necessary. Better standards for distinguishing between *post* and *propter* effects must also be evolved.

I am, Sir, yours faithfully,

Wimpole-street, W., July 11th, 1931. J. A. RYLE.

MORTALITY AFTER PROSTATE OPERATIONS.

To the Editor of THE LANCET.

SIR,—Dr. Minnitt comments on the rise of the blood-urea figure following ether anæsthesia, and apparently concludes that it is an important factor in the mortality after prostatectomy, and that for this operation spinal anæsthesia should be substituted. He quotes an operative mortality of 50 per cent., which is greatly in excess of that obtained from any other source.

In his Lettsomian lectures, Sir John Thomson-Walker gave statistics from 11 general hospitals, in which the total mortality in 3451 cases was 19·5 per cent. The mortality at St. Peter's Hospital from 1901 to the end of 1929 was 9·9 per cent. in 2691 cases. For 1930 it was 7 per cent. It is only natural to suppose that a considerable number of these patients were operated on under inhalation anæsthesia (this is certainly true for the cases in St. Peter's Hospital), and I feel that ether cannot be blamed entirely for the mortality Dr. Minnitt encountered.

I have operated on almost 900 cases of enlarged prostate; about a third of them were given spinal, and the remainder inhalation anæsthesia. There was practically no difference in the mortality-rate of the two series, it fact it was a little higher when I used spinal anæsthesia. Before the war I employed this method in about 90 per cent. of my cases, but I gradually gave it up, and for the last eight years I have only used it occasionally. Spinal anæsthesia is ideal from the surgeon's point of view. It gives complete relaxation, and makes the operation easier than any other form of anæsthetic, but it has certain disadvantages for the patient. The most important of these is the fall of blood pressure. The average fall is about 30 mm. of mercury. With the addition of ephedrine the fall was about 15 mm., while when ether or gas-and-oxygen was used the blood pressure at the end of the operation was approximately the same as that before induction. This fall in blood pressure seriously diminishes the urinary excretion during the

first 24 hours after operation, and it increases the risk of reactionary hæmorrhage.

My impression is that the mortality after prostatectomy depends more on the pre- and post-operative treatment of the patient than on any other factor. Most of the deaths ascribed to "uræmia" or "renal failure" are really due to post-operative pyelonephritis, which may not give rise to symptoms. Post-mortem records show that the kidneys are infected in most cases of post-operative "uræmia."

I have looked up the records of the last 150 cases I operated on in private. There were 5 deaths, 3·3 per cent. All these patients had inhalation anæsthesia. In 15 of them the operation took place in the country, the after-treatment being left to the local doctor; the remaining 135 were operated on in London, and remained under my care during their convalescence. There were two deaths among the country cases, 13·3 per cent., and three among those operated on in London—2·2 per cent. The operation was identical throughout, so the difference in the death-rate must be put down to the post-operative management.

I am, Sir, yours faithfully,

Harley-street, W., July 11th, 1931. J. SWIFT JOLY.

CANE AND BEET SUGAR.

To the Editor of THE LANCET.

SIR,—In 1914 a small book was published on "Heart Disease and Cane Sugar," by the late Dr. A. Goulston, and there was some correspondence on the subject, mostly confirmatory of the author's conclusions, in the medical journals. Briefly, he stated, and supported his arguments by numerous cases, that he had found extra sugar alimentation to the amount of not less than 2 oz. and up to 6 oz. of *cane* sugar daily of very great value in the treatment of failing hearts. His first paper was published in 1911, and some of the cases he quotes are from other practitioners who, as a result of this paper, had tried the sugar treatment with excellent results. I myself tried it both in hospital and private practice, with considerable benefit to the patients, but the advent of the war, and the difficulty of obtaining sugar, made it impossible to carry it on, and later it had almost passed out of my mind.

The author insisted that the results were only to be obtained with *cane* sugar, not with beet, and gives two cases to support this point. To many, in those days, it seemed absurd that there should be any difference in the results given by two substances of identical chemical composition, but to-day our outlook is wider, and we are bound to admit that there may be bodies indefinable by chemical analysis, but of vital importance to the organism, in substances of identical composition but of different origin. The conditions under which cane and beet sugar, respectively, are produced—climate, soil, mean temperature, insolation, irradiation—differ enormously; it is reasonable to suppose that they may, therefore, have different physiological values. If they have, it is really of very great importance that we should know the facts.

As regards the heart, I venture to suggest that these could be determined by careful perfusion experiments.

At the present moment the English nation is engaged in the task of helping to destroy the colonial sugar industry by subsidising beet sugar in the interests of our own decaying agriculture. With the decline of Demarara and the West Indian plantations now rapidly progressing, it seems inevitable that the amount of beet sugar consumed here must increase. Doctors are not concerned with the question whether this demonstration of the difficulties of Imperial Preference is economically sound or unsound, but they should certainly know which of the two forms, in which one of our principal foods is taken by every man, woman, and child in these islands, has the better physiological value, if there be any difference between them. I submit that this might well be a subject of inquiry by the Food Investigation Board, the last number of whose Transactions rather suggests that in the future the coöperation of the biochemist (animal) and the biochemist (vegetable) in problems of this kind may produce valuable results.

I am, Sir, yours faithfully,

Wimbledon, July 6th, 1931. E. HOBHOUSE.

ACUTE RHEUMATISM FOLLOWING TONSILLITIS.

To the Editor of THE LANCET.

SIR,—The valuable paper by Dr. Sheldon and the interesting correspondence following it prompt me to draw attention to statements which occur in a paper which appeared in the *Medical Press and Circular* (1930, cxxx., 7), which I think bear on the subject in a way that may be useful to the discussion. In that paper I pointed out that all cases of throat inflammation are accompanied by some disorder of the heart, and further on stated: "In connection with an epidemic of the 'common cold' one knows that the throat inflammation has a tendency to clear up altogether, and no doubt the heart disturbance also disappears, but we all know that in some cases the throat condition may become subacute or chronic, and we ought also to know to what extent there is some residual disturbance of the heart. This linking up of throat and heart disturbances as part of one systematic serous disturbance is important from the point of view of ætiology, because it helps us to realise that in both cases the exudative processes are upset."

Personally, I believe that acute rheumatism is due to a protozoon, of which the Aschoff body is the encysted form, and in the "acid children" who are predisposed to this disease the throat inflammation gives rise to a blood pressure conducive to the active generation of the protozoon. In all acute cases of acute rheumatism it will be found that the basic blood pressure is raised considerably before an attack, and with the return of temperature to normal the basic blood pressure becomes normal.

I am, Sir, yours faithfully,

Swansea, July 14th, 1931. G. ARBOUR STEPHENS.

MILLER GENERAL HOSPITAL.—According to the report for 1930 there has been a great improvement in the financial position as compared with 1929, when there was "a very real fear that part of the hospital would have to be closed." The building debt of £17,850 is being reduced by the interest from the gift of £20,000 from an anonymous donor to the King's Fund for the reduction of capital charges on voluntary hospitals in the boroughs of Deptford, Greenwich, Lewisham, and Woolwich. Last year there were 2140 new in-patients, a slight fall, explained by a small rise in the average number of days' stay (to 23·44 from 22·93), and to the children's ward having had to be closed twice owing to outbreaks of scarlet fever. The average weekly cost was £3 6*s.* 11*d.* At 30,123 the new out-patients showed a reduction of 1000, which was the more welcome owing to the inadequacy of this department. The old Congregational church which was converted into a temporary out-patient department ten years ago is showing signs of serious structural defects. A new building has therefore become an acute need. A coal-cellar is being used to provide additional accommodation for the X ray department.

BEIT MEMORIAL FELLOWSHIPS.

ANNUAL REPORT.

AT a meeting of the Beit Memorial Fellowship, held on July 14th, the annual report for 1930 of the hon. secretary, Prof. T. R. Elliot, F.R.S., was adopted. The death, on Dec. 8th, 1930, of the founder of the Trust, was a great loss, for besides endowing the Trust with £210,000 in memory of his brother, Mr. Alfred Beit, Sir Otto Beit had devoted close thought to the advancement of the aims of the Foundation, and had shown the keenest pleasure in marking the successes in the advance of medicine by research which had been achieved by the most distinguished of the Beit Fellows

On the expiration of his appointment as director of the Lister Institute, Sir Charles Martin, F R.S., had resigned from the Advisory Board of the Foundation after 21 years of loyal service. His resignation was deeply regretted, more especially since out of the 137 Fellows who had been elected since 1909 no fewer than 31 were assigned to work at the Lister Institute under his general direction, the Institute providing all laboratory facilities.

Sir James Kingston Fowler had resigned from the routine duties of honorary secretary, but the Foundation would retain his services as senior trustee; Sir James Kingston Fowler had been associated with the Foundation even before its inception, since he had taken part in the original discussions with regard to the contemplated benefaction and he had fostered each year's work with unremitting care.

The new appointments recorded were as follows:—Trustees: Sir John Rose Bradford, F.R.S., and Sir Alfred Beit. Advisory Board: Prof. J. C. G. Ledingham, F.R.S., and Dr. P. P. Laidlaw, F.R.S.

The number of Fellows at present working on the Foundation, excluding those reported for election below, is 23. The list of places recognised for research has long been widening, and each year more and more Fellows are being permitted, for special purposes, to work for a year abroad. The Fellows elected choose their own problems for research. The report calls attention to the fluctuations in the subjects proposed year by year, and to the rapidity with which the tide of research "swings first into one bay and then to another, in the pressure to find through allied sciences the means towards fresh advances in medicine. Bacteriology, for example, has so altered its landward approaches that among the present Fellows and the 39 candidates at this July election only a very few are content to attack the problems of microbic disease by the older charted ways. More of the voyagers now are exploring the coasts of biochemistry, and through fundamental studies, by precise test-tube experiments on the metabolic activities of bacteria, or on the modes of ferment action, are seeking to understand their behaviour in the human body. Indeed, for these and like aims, there are of the present Fellows seven now clustered in the biochemical laboratories of Cambridge University."

ELECTION TO FELLOWSHIPS.

The following new Fellows were elected:—

Senior Fellowships (value £700 per annum).

F. R. WINTON, M.A., M.D. Camb. To continue his work in the Pharmacological Laboratory of University College, London, on the tonus of plain muscle, on the blood pressure in the glomerulus of the kidney, and on the effect of drugs on kidney secretion.

Fourth Year Fellowships (value £500 per annum).

B. H. C. MATTHEWS, M.A. Camb. To continue his work in the Physiological Laboratory, University of Cambridge, on the analysis of sensory nerve impulses by electrical records obtained with the delicate oscillograph which he has invented.

Junior Fellowships (value £400 per annum).

BENJAMIN STANLEY PLATT, M.B., M.Sc., Ph.D. Leeds. Re-elected to the Junior Fellowship which he had resigned in 1926 in order to obtain medical qualification and so fit himself more fully for medical research. He will work at the School of Medicine, Leeds, on problems of the alimentary canal.

WILLIAM ALBERT HUGH RUSHTON, Ph.D. Camb. Proposed research: On the chronaxie of nerve and muscle. Place of research: Physiological Laboratory, Cambridge.

LEONARD HUBERT STICKLAND, B.A. Camb., 1928. Proposed research: An investigation of the metabolism of the anaerobic bacteria associated with gas gangrene. Place of research: Sir William Dunn Institute of Biochemistry, Cambridge.

MURIEL ELAINE ROBINSON, Nat. Sci. Tripos, First Class in Parts I. and II. (Physiology), 1922. Proposed research: To continue investigations on hæmoglobin; and on the preparation of proteins in a pure state. Place of research: Sir William Dunn Institute of Biochemistry, Cambridge.

FRANK BURNET BYROM, M.D. Lond., 1926; M.R.C.P., 1926. Proposed research: A study of factors influencing the total water exchange of the human body in health and in disease (in continuation of work begun at Chicago as Rockefeller Fellow). Place of research: The London Hospital.

JANET MARIA VAUGHAN, D.M. (Oxf.), 1930. Proposed research: An investigation of the relationship of disordered hæmotoporisis to those bone changes that are found in human disease or which can be experimentally produced in animals. Place of research: Institute of Pathology, London Hospital.

Dr. C. H. Lambie, who held a Fellowship from 1923 to 1926, has been appointed to a new whole-time Chair of Medicine at the University of Sydney, New South Wales. Dr. D. Keilin, F.R.S., has been chosen for the Directorship of the Institute for Parasitology at Cambridge, to which he was first appointed to work as Junior Beit Fellow in 1920, and where he remained for a total period of seven years' research as Junior and Senior Fellow.

All correspondence of Fellows and candidates should be addressed to the Honorary Secretary, Beit Memorial Fellowships, University College Hospital Medical School, University-street, London, W.C.1.

SHEFFIELD ROYAL INFIRMARY.—The governors are seriously considering the difficult pecuniary position of this hospital. Last year there was an adverse balance of £11,000, and during the first half of the present year the hospital is worse off than in 1930 by £3250. Should the situation not improve it may be necessary to close 80 beds, but an increase in the rate of contributions under the penny-in-the-pound scheme is under consideration on the ground that it is offering greater benefits than it can afford.

VALENCIA ISLAND HOSPITAL.—The tiny hospital on Valencia Island, county Kerry, is one of the few Irish hospitals in a position to extend in recent years without the aid of the hospital sweepstakes. The island is a meteorological station, and a station of the Western Union Telegraph Co. The hospital's patients include fishermen and farmers along part of the mainland coast, as well as those living on the island itself, and also the crews of trawlers and cable boats. Hitherto stretcher operation cases have been obliged to cross the ferry in an open boat to the mainland and to undertake a further journey of 40 miles to Tralee Hospital. There are days in winter when the ferry crossing cannot be made at all. The hospital contains eight beds in all; the largest wards for men and women holds three beds each, and there are sleeping quarters and a sitting-room for a resident matron. An operating theatre and an acetylene plant have now been added, and the hospital is about to be reopened. It is hoped that in the near future it will be possible to add a fever ward and a maternity ward—the latter, for very poor patients, is sorely needed. There is, however, a maternity and child welfare centre which is attended regularly by Dr. Elsie Murphy, the medical officer of health, and a nurse.

THE NATIONAL COLLECTION OF TYPE CULTURES.

EVEN the most superficial examination of the third edition [1] of the catalogue of the National Collection of Type Cultures, which has just been published, must impress the reader with the very considerable progress that has been made since the last edition [2] appeared in 1925. This collection, maintained by the Medical Research Council at the Lister Institute of Preventive Medicine, now comprises over 3000 different strains of micro-organisms of importance in human and veterinary pathology, plant pathology, agricultural and soil bacteriology, fermentation industries and also types useful for teaching purposes. The demand for cultures both at home and abroad has steadily increased, so that now considerably over 5000 cultures are distributed in each year to all parts of the Empire and beyond.

MICRO-ORGANISMS PATHOGENIC TO MAN.

A host of new types have been added to the collection in recent years. Among those of special concern in human pathology may be mentioned the extensive list of salmonella species, culturally similar but serologically distinct, that have been the subject of recent research by Bruce White, Schütze, Scott and others in this country. There has been acquired recently a valuable collection of pathogenic fungi belonging to the genera achorion, trichophyton, microsporon, actinomyces, madurella, sabouraudites, bodinea and others, including many types from the Sabouraud collection and also the isolations of Drs. Hare and Tate made during their researches on the fungi causing ringworm in children attending London County Council schools. Special mention may be made of *Actinomyces somaliensis* and *Madurella mycetomi*, which are associated respectively with white- or yellow-grained and black-grained "Madura Foot Disease" in the Egyptian Sudan (actinomycosis and maduromycosis of Chalmers and Archibald), the organism of "mossy foot" disease of the Amazon region (*Phialophora verrucosa*), the fungus of San Joaquin Valley Disease or coccidioidal granuloma (*Coccidioides immitis*), which has recently become a question of some concern to public health authorities in the New World, and *Scediosporium apiospermum*, the causal organism of a mycetoma in tropical South America and Southern Europe. Among the fungi may also be noticed *Penicillium notatum* Westling, a producer of "penicillin" and first used by Fleming in the elaboration of selective media for the isolation of Pfeiffer's influenza bacillus. A very fine selection of anaerobic bacteria, including the A and B types of *B. botulinus*, were presented to the collection by Prof. Ivan Hall in 1929. This also includes the interesting species *B. sordellii*, Hall and Scott, first isolated by Dr. Sordelli of Buenos Aires from lesions of malignant œdema combining the pathogenic properties of *B. novyi* (*B. œdematiens*) with some of the morphological and cultural characters of *B. sporogenes*.

The name "*B. indicus-ruber*" carries us at once back to the early days of bacteriology, and the catalogue reminds us that this strain, sent through the kindness of Dr. Robert Breed of the New York State Agricultural Experiment Station, was isolated from the alimentary canal of an ape in India by Robert Koch in 1884 during his researches into the ætiology of Asiatic cholera. But this is not by any means the *doyen*, so to speak, of the collection, for further on we find descendants of Duclaux's original isolations of "*Tyrothrix*" species from cantal cheese made in 1878, which were presented a few years ago by Dr. L. Rosenthal of the Pasteur Institute. Of interest also are the original isolations of *B. proteus* X 2 and X 19 made by Weil and Felix during their researches into the ætiology of typhus fever. Among the list of staphylococci one notices the Bundaberg strain of *Staphylococcus pyogenes*, isolated in connexion with the fatalities, still fresh in the memory, following the injection of toxin-antitoxin among children at Bundaberg, Queensland, and described in the report of the Royal Commission of Enquiry. Here also are Burnett's strains of the same organism, some of which are dependent on CO_2 for the production of toxin, while others produce toxin in its absence. Streptococci from scarlet fever are well represented, and include the original Dick strains (*Streptococcus scarlatinæ* I. and II.) used for the preparation of filtrates for use in the Dick intracutaneous test. Under streptococci may also be found specimens of the aerobic strains recently isolated from cases of puerperal sepsis, Birkhaug's non-methæmoglobin-forming streptococci, and Small's strains of *Streptococcus cardio-arthritidis* isolated from cases of rheumatic fever. Under the genus neisseria (which also includes the gonococcus and meningococcus) are listed strains of *Neisseria flavescens*, a new meningococcus-like organism isolated last year by Miss Sarah E. Branham of the U.S. Public Health Service from cases of epidemic meningitis. These organisms differ from the meningococcus in pigment production, lack of fermentation action and in antigenic relationship.

MICRO-ORGANISMS PATHOGENIC TO ANIMALS.

In the domain of veterinary science very extensive additions have been made to the collection. Two strains of *Actinobacillus lignieresi*, one of English and one of Swedish origin, are listed. These organisms were isolated from lesions of cattle suffering from actinobacillosis, a disease in many respects resembling actinomycosis caused by the true "ray fungus." One observes also *B. monocytogenes*, the causal agent of a peculiar disease of rodents associated with an absolute and relative increase of the mononuclear leucocytes in the blood, isolated during a laboratory epizoötic at Cambridge in 1926 and described by Murray, Webb, and Swann. It is curious to note that a similar organism had been isolated the previous year from a South African gerbille, found dead and examined at the South African Institute of Medical Research by Major Harvey Pirie. Under the name *Bacillus welchii* are included two interesting sub-species. One of them, the bacillus of lamb dysentery isolated by Mr. T. Dalling, was presented by the Wellcome Physiological Research Laboratories; the other, isolated from lesions of sheep suffering from "struck" or "gangrene" was isolated by Mr. A. D. McEwen of the S.E. Agricultural College, Wye. One may regard these organisms as possibly separate and distinct species, but at any rate they are serologically distinct from *B. welchii* and from each other. Through the kindness of Lieut.-Col. Hamerton and Dr. Lovell, an interesting series of typical strains of "Morgan's No. 1 Bacillus" (*B. morgagnii*) has been made available. The organisms were isolated from cases of dysenteric colitis among animals at the Zoo, and came from such diverse sources as orang-outang, squirrel, and Abyssinian monkey, green-billed toucan, false moccasin, large-scaled mabma, and pine snake. *B. pseudotuberculosis-rodentium* is well represented,

[1] Medical Research Council, Special Report Series, No. 64, revised. H.M. Stationery Office. 1931. Pp. 112. Price 2s.
[2] See THE LANCET, 1925, ii., 1080 and 1096.

the collection containing a complete selection of Schütze's serological groups and types of these organisms. It is worthy of remark that this organism is non-motile when grown at 37° C. but is actively motile when grown at room temperature, the explanation being that the flagellated "H" form of the organism does not develop at the higher temperature, the non-flagellated "O" form only being present. A serological grouping is also presented by the genus pasteurella, which is here arranged according to the classification of Cornelius. Both with *B. pseudotuberculosis-rodentium* and with the pasteurella group there is no significant correlation between the species of the infected host and the serological type of the organism encountered.

MICRO-ORGANISMS AFFECTING PLANTS.

Of less interest, perhaps, to medical men and veterinarians are the sections devoted to phytopathology and fermentology, but to many others these pages will appear the most attractive. This side of the collection is becoming of increasing importance, for a continuous attempt is being made to satisfy the requirements of mycologists and technical bacteriologists in this country and to make them independent of other sources of supply. Many hundreds of new fungi affecting plants, many of high economic importance, have been added to the collection during the past few years, and a glance at the descriptive list forming Part II. at the end of the catalogue will assure the reader of the importance attached to this aspect of the collection. Here are listed parasitic forms attacking fruit crops, cereals and vegetables, tropical produce and timber, including not only representatives of the higher fungi but also many species of phytopathogenic bacteria. The latter are often closely related, both morphologically and serologically, to various common saphrophytic forms—e.g., *B. fluorescens-liquefaciens* and *non-liquefaciens*—from which they are probably derived. In most cases, however, their specific pathogenicity for their host plants is not open to question.

BACTERIA OF GENERAL INTEREST.

Among organisms of general bacteriological interest may be mentioned the very complete collection of aerobic spore-bearing organisms (to which many systematists consider the generic name "bacillus" should be strictly confined) presented by Dr. W. W. Ford of Johns Hopkins University, whose researches, and those of his co-workers, have done so much to clarify the taxonomic position of this difficult group. Also worthy of mention are Gray and Thornton's collection of soil organisms concerned in the decomposition of certain aromatic compounds (phenol, meta-cresol, and naphthalene), which are used as soil sterilising agents. Pure cultures of these bacteria use these compounds as sole sources of energy in mineral salt media containing inorganic nitrogen. Many interesting types derived from bacterial disease of insects, both harmful and beneficial, are conserved. Typical of the former may be instanced the *Coccobacillus acridiorum* of d'Hérelle, associated with locust disease, and of the latter, *B. paratyphosus-alvei*, the cause of "paratyphoid" of the honey-bee.

PROTOZOA.

Among the protozoa are several species of leishmania, isolated recently in the Near East—*L. agamæ*, isolated from heart blood of grey lizard (*Agama stellio*), Lower Galilee; *L. ceramodactylæ*, isolated in Bagdad from gecko (*Ceramodactylus doriæ*); and *L. tarentolæ*, isolated in Tunis from a similar host. These interesting types were deposited in the collection by Dr. S. Adler of the Hebrew University, Jerusalem. Worthy of remark also are the herpetomonas species, isolated by Noguchi and Tilden from hemipterous insects, and the latex of the milk weed on which they feed, which were used in serological investigations of leishmania and allied species of protozoa.

NOMENCLATURE.

Mention should also be made of the appendix to the preface which contains the resolution of the International Society for Microbiology with regard to the composition and scope of the newly formed Nomenclature Committee of this Society, together with the complementary resolution of the Plenary Congress of the Fifth International Botanical Congress. It is hoped that under the guidance of an authoritative international committee, created in such favourable circumstances, substantial progress and agreement may soon be reached on many difficult questions of bacterial taxonomy and classification.

MEDICAL NEWS

University of Oxford.

The Theodore Williams scholarship in anatomy for 1931 has been awarded to J. W. A. Turner, of New College. The Master and Fellows of University College have awarded the Radcliffe scholarship in pharmacology to D. F. G. Moir, of Magdalen College.

University of London

At recent examinations the following candidates were successful:—

D.P.H.

Part I.—Katherine Barnett, H. L. W. Beach, T. C. Lonie, G. R. Marcano, S. M. Rafi, A. M. Samarasinghe, C. R. Selous Jones, S. P. Srivastava, and Sarah M. F. Walmsley.

Royal College of Surgeons of England.

A quarterly meeting of the Council was held on July 9th. Lord Moynihan was re-elected president, and Mr. R. P. Rowlands and Mr. W. Sampson Handley were elected vice-presidents. Sir Arthur Keith was reappointed conservator of the museum for a further period of five years. Mr. R. H. Burne (physiological curator), Mr. C. F. Beadles (pathological curator), Sir Frank Colyer (honorary curator of the odontological collection), and Mr. C. J. S. Thompson (honorary curator of the histological collection) were re-elected. The Hallett prize for anatomy and physiology was awarded to Mr. S. G. Clayton, of King's College. The second Macloghlin scholarship for medical students was awarded to Mr. R. Y. Stevenson, of Herbert Strutt School, Belper. Mr. E. G. Muir, F.R.C.S., of Middlesex Hospital, was reappointed Bernhard Baron scholar, and the College research scholarship was granted to Mr. L. F. O'Shaughnessy, F.R.C.S. The Fellowship was conferred on Mr. A. A. Davis (Manchester), and Mr. A. L. Light (Leeds and Middlesex). Membership of the College was conferred on Harbans Singh (Punjab and St. Bartholomew's).

Licences in Dental Surgery were conferred on the following:—

Benjamin Bane, N. F. Bunn, John Bunyan, E. L. Clark, Brian Connelly, L. H. G. Cummings, J. C. Dominick, G. T. C. F. du Plessis, T. A. A. Eaves, M. W. Ellwood, C. L. Endicott, R. L. Etheridge, D. W. Goodman, W. G. C. Hackman, L. P. Harte, W. U. Harwood, R. N. Hines, K. A. Johnson, S. J. G. Knott, G. S. Loader, W. P. McEldowney, Alan Mortimer, Leslie Mortimer, W. L. Mountain, R. H. G. Neave, P. E. Probert, M. A. Rahim, J. L. Roberts, H. S. R. Sarson, J. A. Sidebottom, W. M. Sinclair, J. W. Small, Mervyn Snipper, J. H. Stevens, P. J. Stoy, J. V. C. Sutton, Marius Taralrud, R. W. Tuck, D. J. Wandless, and W. J. Wheatley.

Diplomas in Public Health, Psychological Medicine, and Laryngology and Otology were granted jointly with the Royal College of Physicians.

The following professors, lecturers, and demonstrators were elected for the ensuing year:—

Hunterian Professors.—Sir Arthur Keith, six lectures on Recent Advances in Embryology applied to Surgical Problems; Mr. J. P. Hosford, one lecture on Some Factors in the Causation of Hydronephrosis; Mr. R. T. Payne, one lecture on Excretion Urography; Dr. A. Remington Hobbs, one lecture on the

Puerperal Uterus as a Surgical Problem; Dr. J. A. Ryle, one lecture on the Natural History of Duodenal Ulcer; Mr. H. A. Harris, two lectures on the Comparative Anatomical Aspect of Prenatal, Infantile, and Adult Disease in Man and Animals, with special reference to Bone Growth.

Arris and Gale Lecturers.—Prof. W. E. Le Gros Clark, two lectures on the Structure and Connexions of the Optic Thalamus; Mr. A. J. E. Cave, one lecture on the Morphological and Functional Anatomy of the Human Cervical Spine.

Erasmus Wilson Lecturers.—Mr. C. E. Shattock, Mr. C. P. G. Wakeley, Mr. R. Davies Colley, and Mr. E. D. Moir.

Arnott Demonstrator.—Sir Arthur Keith.

Thursday, Nov. 12th, was fixed as the date of the Buckston Browne annual dinner of Fellows and Members.

University of Sheffield.

At recent examinations the following candidates were successful:—

M.D.

E. S. Clayton and J. N. Gale.

FINAL EXAMINATION FOR M.B., CH.B.

* J. E. Edson, A. W. R. Eardley, T. A. Hunt, S. K. Pannikar, and D. R. Rigg.

* With Second-class Honours.

University of Aberdeen.

On July 7th the following degrees and diplomas were conferred:—

M.D.—*B. S. Cran, Peter Henderson, and W. J. Webster.

* Awarded Honours for Thesis.

M.B. and Ch.B.—† W. G. Davidson, † T. N. Morgan, Annie S. Bain, C. L. Barron, John Brennan, J. A. Cardno, Alexander Chalmers, J. W. M. Christie, W. A. Clarke, W. S. Davidson, E. H. W. Duncan, E. W. Duthie, F. M. Duthie, G. I. G. Findlay, W. M. Fotheringham, Winifred I. B. Gibb, William Harkins, D. A. Macdonald, H. E. T. McDonald, William Mackie, Elizabeth A. Marsden, Alexander Matheson, J. F. Mitchell, C. M. McQ. Murray, M. G. Murray, L. R. A. Ogg, A. A. Peat, C. D. Preston, Isobel S. W. Ramsay, W. S. Russell, P. C. B. Shirreffs, J. D. Trail, and James Webster.

† With Second-class Honours.

D.P.H.—R. G. Henderson, Roderick Mackay, William Stewart, and Robert Sutherland.

Queen's University of Belfast.

At a graduation ceremony on July 10th the honorary degree of Doctor of Science was conferred on Dame Louise McIlroy, professor of obstetrics and gynæcology in the University of London, and Mr. Joseph Barcroft, F.R.S., professor of physiology in the University of Cambridge. The following ordinary degrees and diplomas were conferred:—

M.D.—J. H. Biggart,* Jane L. McNeill,* A. J. P. Alexander,† Eric Blackstock, A. E. Campbell, Kirk Forsythe, and J. W. Kernohan.

* Gold medal. † Commendation.

M.B., B.Ch., B.A.O.—Second class honours: Lilian V. Reilly, F. J. Booth, J. B. McKinney, and G. A. W. Neill. Pass degree: F. W. Atkinson, Basil Blewitt, Douglas Boyd, E. C. J. Camps, E. M. Condy, D. H. Craig, J. A. Crockett, R. S. Cromie, W. B. Davis, Edward Davison, N. S. Dickson, Joseph Edon, John Halliday, H. A. Hezlett, Robert Johnston, G. A. Kane, J. J. G. Kerr, J. R. McAdam, Rowan McCombe, Grace E. McConkey, R. M. McMinn, D. W. Macartney, J. A. Magee, H. L. Martin, J. T. Murphy, Howard Nelson, D. J. P. Parker, J. W. Patrick, T. E. Reade, A. G. Ross, R. O'N. Sloane, Raymond Smith, H. D. Sutherland, H. A. Taylor, Gerald Townsley, A. P. Trimble, and T. W. H. Weir.

D.P.H.—Samuel Anderson, J. L. Bradley, Kathleen M. Cathcart, J. A. Crawford, J. A. D. Deeny, P. H. Deeny, Campbell Gardner, Gertrude M. Glenn, T. S. S. Hall, F. F. Kane, J. M. McClenehan, W. C. MacFaul, J. A. MacHugh, B. L. MacQuillan, Grace K. Pollock, and George Smith.

B.D.S.—Lloyd Dornan.

L.D.S.—J. J. A. Bowe, R. G. Chambers, W. B. Forgrave, Sadie Gault, W. A. McClements, D. I. Malcolmson, J. W. Robinson, W. S. G. Rodgers, S. R. Sheane, R. S. L. Sloan, Agnes Smiley, and W. E. Smyth.

The Sinclair medal in surgery was awarded to W. S. Campbell, and the Symington medal in anatomy to W. M. Loughridge.

International Orthodontic Congress.

The second International Orthodontic Congress will be held at the Savoy Hotel, London, from July 20th to 24th, under the presidency of Dr. J. H. Badcock. On the first evening, after the presidential reception, Prof. Elliot Smith will give a popular lecture on Evolutionary Tendencies Affecting both the Teeth and the Jaws. On the following evening there will be a reception by the President and Council of the Royal College of Surgeons of England at the College. On Thursday, July 23rd, a banquet will be held at the Savoy Hotel.

Boston Surgical Society.

At a meeting of this society, on June 10th, the Bigelow medal for excellence in surgery was conferred on Mr. G. Grey Turner, professor of surgery in the University of Durham. In presenting the medal, Dr. F. B. Lund, the president, said that the previous recipients were Dr. W. J. Mayo (1921), Dr. W. W. Keen (1922), Dr. Rudolph Matas (1926), and Dr. Chevalier Jackson (1928). After the presentation Prof. Grey Turner delivered a lecture entitled Some Experiences in the Surgery of the Œsophagus.

University of Dublin.

At recent examinations in the School of Physic, Trinity College, the following candidates were successful:—

M.D.

T. C. Foster, Bernard Moshal, and Albert Sachs.

M.CH.

T. J. Millin and H. A. Brittain.

M.A.O.

W. S. Dickson.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O. (PART II.).

Medicine.—*Brian O'Brien, G. A. Wray, T. M. R. Ahern, D. B. Bradshaw, H. V. Tighe, J. B. Fleming, H. F. G. Irwin, F. C. Jackson, M. G. Leane, I. G. M'Intyre, D. G. Kennedy, A. D. Barber, D. H. S. Boyd, W. A. Hill, T. J. O'Sullivan, J. C. M. Brambell, J. L. Martin, N. H. Leask, R. C. Sutton, H. S. Mason, E. F. Burton, and Joseph Elliman.

Surgery.—*Margaret D. Gregg, Elizabeth K. Roberts, Brian O'Brien, T. F. O'Donnell, Marjorie L. Campbell, T. M. R. Ahern, H. V. Tighe, Charles Ryan, J. C. M. Brambell, F. C. Jackson, Ruth R. Armstrong, A. A. Lisney, W. A. Hill, M. G. Leane, and N. H. Leask.

Midwifery.—A. A. Cunningham, J. A. Wallace, R. D. Scott, L. L. Nel, E. W. West, G. F. Harris, H. J. Garland, and Francis King.

* Passed on high marks.

D.P.H.

Part I.—Harry Nelson, G. C. Dockeray, L. L. Griffiths, W. D. Speedy, Nora A. Stack, R. St. J. Lyburn, Jane A. M. Nagle, and C. P. Wallace.

Part II.—G. C. Dockeray, W. D. Speedy, Harry Nelson, and Nora A. Stack.

D.P.M.

Part II.—G. W. M. Scroope.

The Osler Club.

At a meeting of this Club, held in London on July 12th, the eighty-second anniversary of Osler's birthday, Dr. W. Stobie, the mayor of Oxford, delivered the fourth Oslerian Oration, entitled Osler and Tuberculosis. Dr. A. S. MacNalty proposed, and Dr. A. P. Cawadias seconded, a vote of thanks. An exhibition had been arranged of some of Osler's writings on tuberculosis.

Medical Society of Individual Psychology.

The annual general meeting of this society, preceded by a dinner, was held at the Florence Restaurant on July 9th. Dr. O. H. Woodcock, the out-going chairman, who presided, said that the list of members had quadrupled during the last nine months. Dr. W. Langdon-Brown was elected chairman for the ensuing session, with Dr. F. G. Crookshank as editor, and Dr. Hilda Weber assistant editor of the publications. Dr. Redfern, Dr. Robb, and Dr. James Young were elected to the committee. Dr. T. E. Lawson (to whom applications for membership and information should be addressed at 11, Chandos-street, London, W.1) was re-elected hon. secretary and treasurer.

Royal Medico-Psychological Association.

The annual conference of this association was held last week in Dublin. The President, who was installed in office on the first day of the conference, was Mr. Richard R. Leeper, resident medical superintendent of St. Patrick's Hospital, Dublin. On July 7th Dr. Ariëns Kappers, of Amsterdam, gave a lecture to the association on the Function of the Layers of the Cerebral Cortex. Several other papers were read, among them being one by Dr. Bethel Solomons on Insanity in Relation to the Parturient State; one by Dr. J. R. Lord on Somatic States in Mental Disorders; and one by Prof. W. Burridge (Lucknow) on the Mechanism of Personality. On July 8th the Governors of St. Patrick's Hospital gave an afternoon reception to the members of the Association and a large number of other guests. St. Patrick's Hospital is the oldest mental hospital in Ireland, and owes its foundation to Dean Swift, from whom it is popularly known as Swift's Asylum. It still occupies the original building, though considerably modernised. On the evening of the same day the Association held its annual dinner in the Hall of the Royal College of Surgeons. On July 9th the members of the Association were entertained to lunch by Messrs. Arthur Guinness, Son & Co., and to dinner by the Strollers' Club. On the 10th the President of the Association and Mrs. Leeper entertained a large company of friends at a garden party in the grounds of the Royal Zoological Society, and in the evening the Governor-General and Mrs. McNeill held a reception at the Viceregal Lodge. On July 10th, after a short business meeting, the members went for a motor tour through County Wicklow.

The King has given directions for the reappointment of Sir Hilarion Marcus Fernando, M.D. Lond., as a member of the Executive Council of the Island of Ceylon.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

BILLS ADVANCED.

In the House of Lords on Wednesday, July 8th, the Royal Assent was given by Commission to a number of Acts, including the Sentence of Death (Expectant Mothers) Act; the Mauritius Loan (Guarantee) Act; the Ministry of Health Provisional Orders Confirmation (Manchester and South Staffordshire Joint Small-pox Hospital District) Act; and the Ministry of Health Provisional Order Confirmation (Aylesbury Joint Hospital District) Act.

HOUSING IN RURAL AREAS.

On July 10th, in the House of Commons, Mr. ARTHUR GREENWOOD (Minister of Health) moved the second reading of the Housing (Rural Authorities) Bill. He said that the scheme of the Bill was one to help necessitous rural district authorities. Clause 1 provided that only those rural districts would be eligible for assistance who could show that their financial resources were insufficient to enable them to make adequate housing provision. There were ample powers under the Housing Acts to deal with the recalcitrant or apathetic local authority. They were dealing with a clearly defined problem, that of the housing of the agricultural worker, and the people similarly circumstanced. The scheme was limited to the agricultural part of the rural districts as defined in the Housing Act, 1924. The scheme was to be worked through a special committee to be appointed shortly with the approval of the Treasury and a separate committee to be appointed by the Department of Health for Scotland. The committee would consider applications by local authorities and determine the number and kind of house in respect of which this additional assistance might be given. It would lay down the date by which the houses were to be completed, fix the rent at which the houses were to be let, and also fix the amount of the special annual grant in respect of the houses which had been approved. It was necessary to establish a test of poverty for the areas which were to be assisted. It would be a double test—first, that the product of a 1*d.* rate was less than 5*d.* per head for the population, and, secondly, that the general district rate was more than 10*s.* in the £. The scheme was an emergency one, and the applications had to be in before the end of November. The assistance given under the Bill would be in the form of contributions payable annually for 40 years like the ordinary housing grant, and the county council contributions of £1 per house, permitted under the Housing Act, 1930, would be payable in respect of houses occupied by the agricultural population.

Sir KINGSLEY WOOD criticised the Bill, which he said was an uninspiring, doubtful, minor, rather pathetic but typical contribution of the Government to the needs of the countryside.

HOUSING INFORMATION IN M.O.H. REPORTS.

After further debate,

Lieut.-Colonel FREMANTLE said there was a real danger in the precedent which this Bill would set. For the first time, instead of having a housing subsidy fixed by Parliament they were going to have a variable extra subsidy to be applied for certain very limited areas, which certainly were not most in need of housing reform, however much they were in need of housing improvement. The Conservative Party yielded to no one in their desire to improve housing conditions, and they welcomed any help given to the rural parishes. But it had been pointed out that the expense of this scheme would probably work out at something like £1000 a cottage in the long run. This tremendous expense, in order to build a few cottages, was not justified at the present time, however much it might have been justified in 1919–20. It was a mistake to suppose that because a house had been condemned as unfit for habitation it would never be fit for habitation. Medical officers of health—and he had been one of them—had always condemned houses where they were deficient in vital necessities, such as water-supply, sanitary accommodation, &c., but there were many old cottages that could be put right and made fit for habitation. It was for that reason that the Housing (Rural Workers) Act was passed, which had been found very useful when properly used. Provision was already made, quite apart from this Bill, for bringing pressure to bear on local authorities who did not do their work in connexion with housing or anything else, by the beneficent and far-sighted measure passed in 1929, which provided the only practical way by which local authorities could be dragooned—namely, by the pressure of the purse. It was felt that one great thing required in regard to housing was publicity regarding what was good and publicity regarding defects. It often happened that these things were not known. But there was one method which was always available to the Ministry of Health and to the public, and that was to make use of the annual reports of the medical officers of health. The Ministry could call for a definite survey of a particular area regarding housing, leaving aside for the time being the normal report on public health. He meant a survey by the medical officers of health, both in the districts and the counties. Such publicity would go a long way towards showing to all concerned what were the actual facts and needs.

The Bill was read a second time without a division.

UNHEALTHY DWELLINGS.

In the House of Lords on July 13th the Bishop of SOUTHWARK drew attention to the large number of persons who, in London and elsewhere, are now living in unhealthy underground dwellings, and asked for information as to the number of houses which the local authorities proposed to build in the next five years. He also asked if His Majesty's Government would appoint, in the interests of efficiency and economy, a central housing council to encourage and supervise the building of houses for the working classes; and he moved for papers. He said that the medical officer of health for the London County Council stated that there were about 30,000 basement dwellings in London which were unfit for human habitation, but in which 100,000 people were still living. Sudden and violent falls of rain flooded these basements; apart from that, they were always damp and dreadfully overcrowded. In some of the rooms four or five persons lived and slept. The results to health were deplorable. He was told that children who lived in basements were unhealthier than slum children. They suffered particularly from pneumonia and rheumatism. It was said that continued progress was being made in the closing of basements, but he found that in 1929 only 174 had been closed. In fact his information was that the occupation of basements was extending. He knew that in South London there were more basements in use now than there had been eight or nine years ago; and he was informed that this was happening all over London. The local authorities had power to close basements as sleeping places if they were proved to be unhealthy. Their powers should be extended to closing living-rooms in basements if unhealthy, as it was impossible by inspection to decide which rooms were used for living and which for sleeping. It was true that large numbers of the occupiers of these unhealthy dwellings did not desire to remove. That was due to some extent to the protection they received under the Rent Restriction Acts. Even for basements the rents were raised at once for new tenants. But his experience was that the majority

of occupiers were anxious to remove if they could obtain better habitations. He asked the Government to urge local authorities to regard unhealthy basements as the first thing to be dealt with in their housing policy; to introduce legislation to strengthen the existing law, if it required to be strengthened, and to make inquiries and publish the results on the health of people living in basements.

DIFFICULTIES.

Lord JESSEL said that the local authorities in London fully sympathised with the views expressed by the Bishop of Southwark, but they realised that the question was surrounded by many difficulties. There was difficulty, for example, in condemning certain dwellings because they were not technically insanitary according to the law; and there was also the difficulty already referred to—namely, the tenants did not always wish to remove.

Lord BUCKMASTER said that if there were difficulties the local authorities ought to clear them out of the way; the difficulties, though grave, were not insuperable. What was the use of building new houses if the slum-dwellers could not afford to pay the rents? The slum problem would have to be approached on a far wider and broader basis than had yet been attempted. In that matter he was prepared to go any length, because he found it difficult to live easily when he contemplated the horrible conditions in which people had to live around him. It was perfectly clear that until the unrestricted birth-rate could be controlled this problem would never be solved.

Lord DICKINSON said that according to the information at his disposal things were getting worse instead of better in this connexion. While the population of the County of London was decreasing the number of persons in the occupation of underground dwellings was increasing. The great difficulty was to offer the provision of alternative accommodation. He suggested that a definite survey should be made of basement dwellings, to be followed by a definite programme of providing alternative accommodation.

AGREEMENT IN PRINCIPLE.

Lord SNELL (Under Secretary for India) said that the Government were in complete agreement with the main principle of the Bishop of Southwark's speech. This was a problem of great urgency. He was advised that the powers possessed by the local authorities were adequate for dealing with it. Under the Slum Clearance Act of last year any part of a house, above or below ground, which was let separately could be closed for habitation if proved to be unhealthy. The local authorities must not be diverted from their systematic attack on bad housing conditions generally to one aspect of it alone; there was no short and easy solution along those lines. The great difficulty was to rehouse the people in the slums, and the closing of a basement did not provide a new site. The Housing Act of 1930 was an earnest of the Government's intentions to deal drastically with the whole problem of the slums. The outlook for building was not unpromising. Five years' building programmes had already been submitted by 280 local authorities, covering five-eighths of the population of England and Wales, who proposed to build 340,000 houses. The Government would not neglect to keep local authorities alive to their responsibilities in the matter, though they were aware that local authorities generally were generously responding to their appeal to make use of the new slum clearance powers and resources provided by the Act of 1930. In the opinion of the Government, the setting up of a central housing council suggested by the Bishop of Southwark would be unwise. The Government were watching the situation, and they believed that they were reducing the problem of slum clearance to manageable proportions, though much remained to be done.

The Bishop of Southwark withdrew his motion for paper

HOUSE OF COMMONS.

THURSDAY, JULY 9TH.

Maternal Mortality.

Dr. PHILLIPS asked the Minister of Health how many local authorities had now replied to his circular on maternal mortality, issued in December, 1930; how many of these proposed to make improvements in their services; which local authorities proposed to make no improvements; which local authorities had not yet replied; and what were the latest figures of maternal mortality in areas which made no proposals for improved services or had sent no replies to the circular.—Mr. GREENWOOD replied: The following is the information asked for: 139 local authorities have now replied to this circular, and of these 102 propose to make improvements in their maternity services, while 13 state that the circular is still under consideration. I am sending a further communication to those authorities who have not yet replied to the circular. The following authorities do not propose at present to extend their maternity services: Berks, Flintshire, and West Suffolk county councils; Chepping Wycombe, Colchester, Cowbridge, Eastbourne, Hereford, Hove, Lytham St. Anne's, Newcastle-upon-Tyne, Reading, Sutton Coldfield, Thornaby-on-Tees, and Wallsend borough councils; Kensington and Westminster metropolitan borough councils; Aberdare, Barking Town, Barry, Northfleet, Stone, and Tettenhall urban district councils; and Tonbridge rural district council. As regards the last part of the question, the only available figures as to maternal mortality are published in the Registrar-General's Statistical Review which gives the figures for each county and county borough.

Poor-law Relief.

Sir KINGSLEY WOOD asked the Minister of Health the number of persons in receipt of poor-law relief in England and Wales.—Mr. GREENWOOD replied: The total number of persons in receipt of poor relief in England and Wales (excluding rate-aided patients in mental hospitals, casuals, and persons in receipt of domiciliary medical relief only) on Saturday, June 6th, 1931, was 992,450.

Vaccination.

Mr. WINTERTON asked the Minister of Health, in view of the recent cases of deaths and of blindness following vaccination, whether he would consider the appointment of a representative committee of inquiry to inquire into the whole subject and to report to Parliament.—Mr. GREENWOOD replied: The subject dealt with in my hon. friend's question was fully investigated by the Committee on Vaccination, whose reports were issued in 1928 and 1930, and I do not see the necessity for any further inquiry at the present time.

Mr. FREEMAN: Is the right hon. gentleman able to announce any decisions on the statement which he made a year ago as to the whole administration of the Vaccination Acts?

Mr. GREENWOOD: No, I cannot.

Mr. WINTERTON asked the Minister of Health whether, in view of the admission that the deaths of the twin children of Councillor A. A. Furness, of South Wigston, near Leicester, were due to post-vaccinal encephalitis, he proposed to take any steps to prevent the further use of Government lymph in this district.—Mr. GREENWOOD replied: The answer is in the negative. I am advised that there is no reason to associate the deaths of these children with the use of Government lymph.

Deaths in Convict Prisons.

Mr. FREEMAN asked the Home Secretary how many cases of natural death, suicide, and attempted suicide, respectively, had taken place in the convict prisons, local prisons, and Borstal institutions, respectively, during the 12 months ended May 31st, 1931, giving age, sex, cause, and date in each case.—Mr. CLYNES replied: Of natural deaths there were 8 in convict prisons, 22 in local prisons, and 1 in a Borstal institution. Of suicides there were none in convict prisons, 3 in local prisons, and 2 in Borstal institutions. In compiling any return of attempted suicides there is always a difficulty in determining whether certain cases are real attempts at self-destruction or are merely feigned attempts, undertaken for some other purpose; but so far as can be ascertained, the number of cases which can properly be classed as attempts to commit suicide were in convict prisons 1, in local prisons 20, and in Borstal institutions 1.

MONDAY, JULY 13TH.

Pensions Ministry and Medical Treatment.

Major EVANS asked the Minister of Pensions whether he would produce and issue for general information a comprehensive and scientific record of the experiences and achievements of the Ministry in medical and surgical

spheres, including treatment of wounds, disorders of the nervous system, and other diseases.—Mr. F. O. ROBERTS replied: A review of the Ministry's experience in the handling of the principal war disabilities has been prepared by the Ministry for inclusion in the forthcoming "Official Medical History of the War," which I understand will be issued at a very early date. I may add that I am entirely in sympathy with my hon. and gallant friend's suggestion, and have already under consideration what further steps, if any, can usefully be taken in this direction.

Army Recruits and Physical Unfitness.

Mr. LOUIS SMITH asked the Secretary of State for War what was the percentage of those offering themselves for enlistment in the Army who were rejected in respect of physical unfitness in each of the past ten years; and the total number rejected in each of such years.—Mr. T. SHAW replied: The information is as follows:—

Recruiting year ending (on or about) Sept 30th.	Number of men served with notice papers.	Total number rejected.	Number rejected for physical or medical reasons.	Percentage of men served with notice papers who were rejected for physical or medical reasons.
1921	106,071	58,343	51,021	48·1
1922	106,954	64,661	59,736	55·9
1923	86,039	53,491	49,550	57·6
1924	84,506	52,886	49,245	58·3
1925	89,277	56,228	52,207	58·5
1926	83,092	52,627	48,800	58·8
1927	83,814	54,495	50,396	60·1
1928	82,938	51,509	47,552	57·3
1929	72,268	43,023	39,359	54·4
1930	66,717	39,022	35,425	53·1
	861,676	526,285	483,291	56·1

Pensions and Final Medical Awards.

Mr. MARCUS asked the Minister of Pensions if he was aware of the hardship caused by the granting of final awards in cases of recurrent disability, such as neurasthenia, gas-poisoning, malaria, and others; and if he was prepared to grant further consideration to ex-Service men whose disability might recur at any time after their final award was finished, with a view to awarding them either treatment with full allowances over a certain period or a further award of pension, conditional on the duration of a man's illness which was directly due to one of the recurrent disabilities mentioned.—Mr. F. O. ROBERTS replied: A final award is not, under the statutory regulations, made until the man's condition is reasonably stable, each case being considered on its merits and in the light of expert opinion as to the particular ailment or disease. In any event the man has a right of appeal for a year to an independent appeal tribunal. If a condition due to war service subsequently calls for treatment, it can be provided and allowances can also be paid where they are justified notwithstanding that a final award may have been made. If, as a result of such treatment, a final award should be found to have been seriously erroneous as an assessment for permanent purposes, a further grant of pension can be made under special sanction.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. Asst. Surgeon.
Accrington, Victoria Hospital.—H.S. £150.
All Saints' Hospital for Genito-Urinary Diseases, Finchley-road, N.W.—H.S. At rate of £150.
Altrincham General Hospital.—Sen. and Jun. H.S. At rate of £150 and £100 respectively.
Beckenham, Kent, Bethlem Hospital, Monks Orchard, Eden Park. Res. H.P. At rate of £150.
Bedford County Hospital.—Asst. H.S. At rate of £130.
Birmingham P.H. Dept., Tuberculosis Section.—Asst. M.O. £400.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O. £500.
Bradford Children's Hospital.—H.P. £120.
Bradford Royal Infirmary.—Three H.S.'s. Each £150.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Brighton, Sussex Maternity and Women's Hosp.—Res. H.S. £130.
Bury Infirmary, Lancs.—hird H.S. At rate of £150.
Calcutta, Presidency General Hospital.—Second Res. M.O. Rs. 1000 a month.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. At rate of £130.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. At rate of £275.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Connaught Hosp., Walthamstow, E.—Res. H.P. At rate of £100.
Coventry, Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Dreadnought Hospital, Greenwich.—Physician, for Dept. of Physical Medicine. 50 guineas.
Dudley, Guest Hospital.—H.S. and Asst. H.S. £200 and £170, respectively. Also Hon. Orthopædic Surgeon
Dumfries, Crichton Royal Mental Hosp.—Asst. Physician. £350.
Durham County Hospital.—Two H.S.'s. Each £150.
Durham University College of Medicine.—Jun. Demonstrator in Physiology. £250–£300.
East London Hospital for Children, &c., Shadwell, E.—H.S. and Cas. O. £125.
Essex County Council.—First Asst. M.O. £750–£800.
Exeter, Royal Devon and Exeter Hospital.—H.P. and H.S. to Special Depts. Each at rate of £150.
Gravesend and North Kent Hospital.—Jun. H.S. £100–£150.
Great Yarmouth General Hospital.—H.S. £140.
Harrogate Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £125 respectively. Also H.P. At rate of £150.
Hertford County Hospital.—H.P. At rate of £150.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
***Hull Royal Infirmary.*—3rd H.S. At rate of £150.**
Inverness, Royal Northern Infirmary.—Two H.S.'s. Each at rate of £100.
***Ipswich, East Suffolk and Ipswich Hospital.*—Cas. O. £120.**
Kent Education Committee.—Temporary School Medical Inspector. 12 guineas per week.
Kidderminster and District General Hospital.—H.S. £150.
King Edward Memorial Hospital, Ealing, W.—Sen. and Jun. Res. M.O.'s. £250 and £150 respectively.
Kingston-upon-Hull, City and County of.—Sen. Asst. M.O.H. for Maternity and Child Welfare Dept. £800.
Lancaster Royal Infirmary.—Jun. H.S. £130.
Leamington Spa, Warneford, General Hospital.—Hon. Surgeon for Diseases of Ear, Nose, and Throat.
Leeds Hospital for Women.—H.S. At rate of £100.
Leicester Royal Infirmary.—Sen. M.O. for Venereal Diseases Dept. £500.
Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophth. Dept. £120.
Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester, Ancoats Hospital.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Manchester, Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Jun. H.S. At rate of £125.
Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.
Newcastle-upon-Tyne, Newcastle General Hospital.—Two H.P.'s and three H.S.'s. All at rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Whole-time Jun. Surg. Reg. £150. Also Sen. Surg. Reg. £100.
Northwood, Mount Vernon Hospital.—H.S. At rate of £150.
Nottingham General Hospital.—Cas. O. At rate of £200.
Port Said, British Hospital.—Res. Asst. M.O. £375.
Portsmouth, St. Mary's Hospital, St. Mary's Institution, &c.—Second Asst. Res. M.O. £300.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150. Also H.P. £180.
Royal College of Physicians, Pall Mall East, S.W.—Streatfeild Research Scholarships. £250.
Royal Northern Hospital, Holloway, N.—Asst. Pathologist. £500.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Urological Surgeon.
St. John's Hospital, Lewisham, S.E.—H.S. and Cas. O. Each at rate of £100.
St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.
St. Thomas's Hospital Medical School, S.E.—Sen. Demonstrator in Anatomy. £500.
Salisbury General Infirmary.—H.P. £150.
Scunthorpe and District War Memorial Hospital.—Res. Surgeon. Also second H.S. £250 and £150 respectively.
Sheffield, Children's Hospital.—Whole-time Med. Registrar-Pathologist. £350. Also **3rd Res. M.O. At rate of £80.**
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.
Sheffield Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £150 and £80, respectively. Also Ophth. H.S. £120.
Sheffield Royal Infirmary.—H.S. and Second Asst. Cas. O. Also Ophth. H. S. Each at rate of £80.
Southampton, Free Eye Hospital.—H.S. £150.
Southport General Infirmary.—Jun. H.S. £150.
South Shields, Ingham Infirmary.—H.S. £150.
Stafford, County Bacteriological Laboratory.—Bacteriologist. 12 guineas per week.
Staffordshire, Longton Hospital.—H.S. £120.
Swansea General and Eye Hospital.—H.P. £150.
Swindon and North Wilts Victoria Hospital.—Res. M.O. At rate of £125.
Tynemouth.—Asst. M.O. for Poor Law Institution, Preston-road, North Shields. £300.
Walsall General Hospital.—H.P. At rate of £150.
Windsor, King Edward VII. Hospital.—Hon. Asst. P. to Out-patient Dept.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Teddington (Middlesex), and at Higham Ferrers (Northants).

Vacancies are announced for a Physician and a Surgeon as Medical Referees under the Workmen's Compensation Act, for Circuit 31, County Courts, Aberavron, &c.—Applications should reach the Private Secretary, Home Office, Whitehall, not later than August 5th.

NOTES, COMMENTS, AND ABSTRACTS

MENTAL INEFFICIENCY AND ADOLESCENT CRIME.*

BY W. NORWOOD EAST, M.D., M.R.C.P. LOND.,
ONE OF H.M. COMMISSIONERS OF PRISONS.

THE Mental Deficiency Act of 1927 has been in operation long enough to enable some of the diagnostic difficulties arising from the statutory definitions of mental defectiveness to be reviewed. A clear appreciation of those difficulties is of particular importance in criminal cases, and is essential for accurate testimony.

The distinction of idiocy and imbecility from insanity has been recognised by law and medicine for many years. The term "feeble-minded," however, denoting a less severe grade of mental deficiency than imbecility, was introduced into medical literature somewhat tardily. The word "feeble-mindedness" appears in the "Dictionary of Psychological Medicine," edited by Dr. D. Hack-Tuke, and published in 1892, and the reader is referred to dementia, idiocy, and imbecility for information. But there is no mention of feeble-mindedness in any of the descriptions of dementia, nor in the article by the late Dr. G. E. Shuttleworth on idiocy and imbecility; and we are left to conclude that the word "feeble-mindedness" connotes these conditions.

Dr. W. Ireland,[1] in 1900, wrote:—

> "Idiocy is mental deficiency or extreme stupidity, depending upon malnutrition or disease of the nervous centres, occurring either before birth or before the evolution of the mental faculties in childhood. The word 'imbecility' is generally used to denote a less decided degree of mental incapacity. The term 'feeble-mindedness' is now much used in the United States of America, both in legal and medical documents, to denote both idiots and imbeciles."

Still later, in 1906, Dr. Maudsley[2] wrote:—

> "Idiocy is a defect of mind which is either congenital, or due to causes operating during the first few years of life, before there has been a development of the mental faculties, and may exist in different degrees; the person afflicted with it may have the power of articulate speech and manifest a limited degree of intelligence, or he may be utterly destitute of any semblance of intelligence and of the power of speech, being little more than a mere vegetative organism. Imbecility is simply weakness of mind owing to defective development, and may be of every degree of deficiency, moral and intellectual; on the one hand, passing by imperceptible gradations into idiocy and, on the other hand, passing insensibly into ordinary intelligence."

Before this, however, high-grade cases were recognised as a distinct group by some of those who were concerned with their supervision. Amongst these were the medical officers of English prisons, who for many years drew attention in their official reports to a class of prisoner they described as weak-minded, and it is clear that they had in mind people who were neither idiots, imbeciles, nor insane. Again, in 1889 the Report of the Royal Commission on the Blind, Deaf, and Dumb recognised a class of feeble-minded children other than imbeciles, and made a recommendation that they should be separated from ordinary scholars in public elementary schools. And when a Departmental Committee on Defective and Epileptic Children was appointed in 1896, the terms of reference expressly differentiated feeble-minded and defective children from idiots and imbeciles; and the Committee reported that the feeble-minded children referred to in their inquiry were a distinct class from imbeciles, and differed both from ordinary children and from imbeciles.

By 1904 the term "feeble-minded" was in general use, and the class of case to which it referred was recogni-ed to be less defective than idiots or imbeciles. A Royal Commission was appointed that year "to consider the existing methods of dealing with idiots and epileptics, and with imbecile, feeble-minded, or defective persons not certified under the Lunacy Laws," and the Royal Commissioners recommended "the use of the words "mentally defective" "as a general term indicative of all classes of mental disorders, thus displacing the word 'lunacy' from that position." They defined "idiots" as persons so deeply defective in mind from birth or an early age that they are unable to guard themselves from common physical dangers, such as, in the case of young children, would prevent their parents from leaving them alone. "Imbeciles" were persons who are capable of guarding themselves against common physical dangers, but who are incapable of earning their own living by reason of mental defect existing from birth or an early age. "Feeble-minded persons" were persons who may be capable of earning a living under favourable circumstances, but are incapable from mental defect existing from birth or an early age (*a*) of competing on equal terms with their normal fellows; or (*b*) of managing themselves and their affairs with ordinary prudence. "Moral imbeciles" were persons who from an early age display some mental defect, coupled with strong vicious or criminal propensities, on which punishment has little or no deterrent effect. These definitions were modified in the Mental Deficiency Act, 1913, as follows:—

> "Idiots—that is to say, persons so deeply defective in mind from birth or from an early age as to be unable to guard themselves against common physical dangers.
>
> "Imbeciles—that is to say, persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves or their affairs; or, in the case of children, of being taught to do so.
>
> "Feeble-minded persons—that is to say, persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others, or, in the case of children, that they by reason of such defectiveness appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools.
>
> "Moral imbeciles—that is to say, persons who from an early age display some permanent mental defect coupled with strong vicious or criminal propensities in which punishment has had little or no deterrent effect."

New Definitions Under the Act of 1927.

Experience in the administration of the Mental Deficiency Act suggested the desirability of certain amendments, and when encephalitis lethargica spread throughout Europe in 1918, and was in many cases followed by the post-encephalitic syndrome, public opinion became aroused by the inadequate provisions which were available for protecting these patients and the public from the consequences of the moral changes which were induced by the disease. The Mental Deficiency Act of 1927 followed. Defectives are defined in Section 1 of this Act thus:—

> "Idiots—that is to say, persons in whose case there exists mental defectiveness of such a degree that they are unable to guard themselves against common physical dangers.
>
> "Imbeciles—that is to say, persons in whose case there exists mental defectiveness which, though not amounting to idiocy, is yet so pronounced that they are incapable of managing themselves or their affairs or, in the case of children, of being taught to do so.
>
> "Feeble-minded persons—that is to say, persons in whose case there exists mental defectiveness which, though not amounting to imbecility, is yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others, or, in the case of children, that they appear to be permanently incapable by reason of such defectiveness of receiving proper benefit from the instruction in ordinary schools.
>
> "Moral defectives—that is to say, persons in whose case there exists mental defectiveness coupled with strongly

* Read at a Conference of Prison Medical Officers at the Home Office, March 28th, 1931.

vicious or criminal propensities and who require care, supervision, and control for the protection of others."

The Act further declares that "for the purposes of this section, mental defectiveness means a condition of arrested or incomplete development of mind existing before the age of 18 years, whether arising from inherent causes or induced by disease or injury." These familiar definitions are given at length to illustrate the change that has taken place during recent years in the conception of mental deficiency. We now deal with cases under this heading whom F. D. Turner [4] graphically asserts belong to the hotch-potch of conditions known as mental deficiency. We are not concerned with mental deficiency in children, nor with idiots who never appear in a criminal court; and since the diagnosis of imbecility presents no practical difficulties, it is only necessary to direct our attention to-day to feeble-minded persons and moral defectives. Before doing so certain alterations in the Act of 1927 require consideration.

Mental defectiveness as now defined seems to refer to other cases than such as were deemed to be mentally defective by the Royal Commissioners appointed in 1904. Nevertheless the conduct of a patient may be regarded by one medical man as evidence of feeble-mindedness, and by another practitioner of equal authority as the result of a psychosis—e.g., the post-encephalitic, delinquent, whose conduct is constantly dealt with by certification under the Mental Deficiency Act, although in many cases the indications of mental abnormality are those of mental disease and not defect. Marshall has pointed out that the post-encephalitic, naughty, restless child who, like Peter Pan, never grows up, is suffering from psychomotor excitement similar to that which may occur in the course of an attack of mania of the manic-depressive type.[5] Further, it may be argued that the biogenic psychoses of adolescence fall within the definition of mental defectiveness. However this may be, the Amending Act removes certain barriers which formerly separated mental deficiency and insanity, and demands a wider conception of the conditions for which certification is desirable. And whereas certain medical men appeared to view mental deficiency in the light of the Act of 1913 in terms of defective brain structure, this, although true for primary amentia, is probably not so applicable to secondary amentia, where the emphatic criterion of mental defectiveness, as defined in the Act of 1927, is defective mental functioning expressed by abnormal conduct and social incapacity.

A second important change in the later Act is the provision that the defectiveness may be brought about by disease or injury arising before the subject is 18 years of age. And it has been observed many times that patients who become affected after this age may be ineligible for the benefits of institutional care in consequence. In other patients the date of onset of ambulatory disease may be undetermined, and the diagnosis of mental defectiveness is abrogated in consequence.

A third noteworthy alteration is the omission of the word "permanent" from the definition of moral defectives in the Act of 1927. The omission avoids the rejection of post-encephalitic cases, for, in the present state of medical knowledge, it is doubtful to what extent the moral defects attributable to this disease are permanent. But the amendment sometimes embarrasses the medical examiner, and deprives him of a useful aid to diagnosis.

In dealing with criminal cases the practitioner must always be prepared to support his opinion under cross-examination in a court of law. Facts observed by himself can be substantiated with assurance. But the arrested or incomplete development of mind which is so pronounced that the subject "requires care, supervision, and control for his own protection and that of others," may be determined only by the history. Generally speaking, the medical man has no first-hand knowledge of this, and it is essential to test it as far as possible; otherwise harmless incidents may assume undue importance, and fictitious exaggerations or intentional inaccuracies, if accepted without caution and criticism, may lead away from truth.

The mental defect of the feeble-minded may be mainly one of intelligence; that of the moral defective may be expressed by defects of character and temperament, and overlapping may occur in either direction. Further, the physical, physiological, and sociological features of each case must be considered as well as the innate dispositions and emotional qualities. Moreover, the greater the intelligence defect the less are defects of character and temperament required for the diagnosis of feeble-mindedness, and the moral defective may show little or no defect of intelligence. Further, as the mental defect of the feeble-minded is a general and not a special defect, so the mental defect of the moral defective is a general defect of character and temperament, of the instinctive tendencies and their emotional qualities, and not a defect in any special or limited direction. But defects of character and temperament, expressed by peculiarities of conduct, are common to mental defectiveness, and to certain normal and abnormal mental states with which they may be confused.

The Differentiation of Clinical Groups.

At the outset we require a working conception of the normal mental state. This may be regarded conveniently as the usual mental reaction-type of individuals belonging to the same class and race and of the same education; normal conduct may be regarded as a composite abstraction, the result of their average variations. If we wish to go further and distinguish between the abnormal and the pathological, we may find assistance from C. Spearman,[6] who points out that "for most practical purposes the crux does not lie in settling whether a person is pathological or not; but whether he is too much so to be tolerated." Accepting this, we are faced with the fact that the behaviour of criminals, as well as of persons who are mentally pathological, has been found intolerable by others; and Spearman refers to the views of those who consider that criminals should be looked on only as mentally ill and punishment be abolished. A reply to this from those who have spent their professional lives in prison work might appear biased, so I again turn to Prof. Spearman, who writes:—

> "One answer to such a claim would be to make a general comparison between the denizens of the jail and those of mental hospitals. For although no single formal definition may serve as a reason to distinguish them adequately, and although certain individual cases might equally well be assigned to either residence, yet on the whole the two classes stand out distinctly enough. If any man really could not tell which class he had got among, we might safely prophesy to which of them he was heading."

Clinical psychiatry assists us in the differential diagnosis between cases of high-grade mental defectiveness and the symptom-complex of any particular mental disorder. Psychology guides us in our pursuit of character formation, and helps us to appreciate the temperamental faults which suggest mental defectiveness. But the present fluid state of psychology, the various schools of psychological thought, and the disputes among eminent psychologists concerning basic principles, may leave the inquirer dissatisfied with any single line of approach. The hormic, hedonistic, behaviouristic or other school of psychology may provide the most acceptable solution to any particular problem of criminal conduct, and the investigator may prefer to retain his psychological freedom in eclecticism. But many students of character, following the teachings of W. McDougall, A. F. Shand, C. Burt, A. G. Tansley, and others, perceive the essential factors of human conduct to be the innate instinctive dispositions, and their accompanying emotional qualities.

In criminal conduct the acquisitive, aggressive, sex, social, and self-preservative instincts are most frequently at fault, and with the associated emotions

act with various degrees of strength in different individuals, and in the same individual at different times. Two or more instincts may be simultaneously in action, opposing or reinforcing one another, and certain life-histories seem to indicate an entire lack of one or other instinct. It is a matter of common observation also that, when the unusual strength of some particular instinct tends towards anti-social conduct, the individual learns to restrain its activities in order that he may adjust his life successfully. Although certain psychologists seem to have no place for the will in their explanation of human conduct, many practical observers find it necessary to postulate an agency, in addition to reason, by which the instinctive tendencies and the emotions become inhibited, and character and conduct modified.

The failure of delinquent adolescents to exercise the self-control demanded by social convention may indicate the incomplete or arrested development of mind which we call mental defectiveness. But it may be due to malnutrition of character, or failure to grasp the value of inhibition and develop a process capable of growth. Observation under experienced supervision, discipline, and training is sometimes necessary to determine whether the fault is due to mental defectiveness or whether the essential ingredients of character can expand and the subject become socially acceptable. As the growth of intelligence is slow in certain individuals, so, too, is character development delayed in others. A common manifestation of this fact is mental instability, which may remain a handicap throughout life, although the subject may become stabilised with the passing of adolescence if growth is resumed on lines which are favourable to social adjustments.

Certain observers hold that mental instability results from defect of mental function, others from excess. Dr. A. F. Tredgold,[7] bearing in mind the instability which is common in the early stages of dementia paralytica and arterio-sclerotic dementia, and that the neurones in these conditions have been shown to be deteriorated, feels justified in considering constitutional mental instability as due to an inherent defect of the controlling functions. On the other hand, emotional instability is a prominent symptom of exophthalmic goitre, in which the general symptoms are attributed by many observers to excitation of the sympathetic, and no material changes are to be found in the cervical sympathetic, brain, or spinal cord.

It might be thought that the mental instability of adolescence would be amenable to organotherapy, in view of the important part played by the endocrine glands at this period of life, and the knowledge that a definite relation exists between their secretions and certain psychoses. The results of my own experience in treating selected cases of mental instability in juvenile delinquents on these lines have been discouraging. The complex reactions which cause the endocrine imbalance make the selection of a suitable therapeutic preparation experimental, even if the appropriate ingredients are capable of isolation in an active state and can be suitably combined. But the researches of biochemists lead one to hope that the treatment of certain cases of adolescent delinquency by glandular extracts may become established in the future.

The clinical manifestations of mental instability are excessive ideational, instinctive and emotional reactions, which, in severe cases, are so frequent and so little inhibited that social adaptation fails. If defects of intelligence are present also, the diagnosis of mental defectiveness is clear. If they are absent, the question arises whether the condition satisfies the rubric "mental defectiveness," whether the disproportionate reactions are due to an undeclared psychosis, or whether the symptoms indicate a transitory phase of adolescent growth.

The Constitutionally Inefficient.

If the controlling functions of the mind are known to have been impaired throughout the pre-adolescent period, and the environmental conditions have been entirely favourable, we can exclude with some degree of accuracy both pre-psychotic and transient adolescent instability, and have some reason to suppose that we are dealing with an inherent constitutional defect which may satisfy the statutory definition of mental defectiveness. But it seems proper to hesitate before a transitory delay in the development of character and control is stigmatised as mental defectiveness, unless enforced by the exigencies of any particular case. For all will agree that the Mental Deficiency Act of 1927 should implement the spirit of the Mental Treatment Act of 1930. Many cases of this nature can be determined only by the efflux of time, and the after-careers of some who improve temporarily show permanent defects when they are released from supervision. On the contrary, other cases who for years appear to be examples of permanent mental defectiveness recover later, and are then established as cases of delayed development.

The child of a bad-tempered woman was too nervous to read aloud at school, and when her teacher complained to her mother she was beaten, with the result that she became rebellious, wilful, and obstinate. She went into domestic service when 13 years of age, and stole a ring from her mistress; several thefts followed. She was eventually sent to an industrial school, and later to a reformatory. At this period she was reported to be a thief and a liar, and to exercise a bad influence on other girls. On her return home she worked for a time in a factory, but when 18 years of age was put on probation for sleeping out. She was sent to a home but ran away and returned to her parents, but later took a young girl away with her to a distant city, where she was soon after arrested for being drunk and disorderly. She was then sent to a Borstal Institution, where her conduct was so outrageous and her history so anti-social that she was considered to be mentally defective, and was certified and sent to an institution for defectives. She became still more difficult, and was transferred to a mental hospital, whence she escaped twice. She was then sent to another mental hospital and escaped from there also, and did not come under supervision again until she committed another theft. Her records show that she was liable at this period to outbreaks of rage and violence for no apparent cause. She damaged the hospital property, assaulted the nurses, threatened the doctor, and attempted suicide. She was deceitful, and appeared to lack any sense of right or wrong or of her social obligations, and was considered to be incapable of earning her own living. But soon after, during a period of detention in prison, she behaved well in spite of this.

Some time after her release, and when 25 years of age, she married a widower several years her senior. She was devoted to him and his child, and lived a happy, useful, and domesticated life for six years. Her husband was then taken to hospital for an operation, and she stole from a city store during this period of stress and when tempted by a former associate. She was sentenced to a short term of imprisonment, during which she conducted herself rationally, and was industrious, capable, alert, and intelligent. Her mental age was 13–14 years, her vocabulary 12,520 words. She was well informed on matters of ordinary interest and common knowledge, and discussed with me her past conduct with frankness and insight. She showed no evidence of emotional disturbance, and had a clear appreciation of her moral obligations. Her perception, judgment, and reasoning were good. I found no evidence of mental defectiveness or mental disease. She was, in fact, stabilised. The mental conflicts of childhood were apparently responsible for the anti-social conduct of subsequent years, but were now replaced by harmony and maturity and consequent social adjustment. Perhaps a different view might have been taken in the past if her medical examiners had been able to obtain her coöperation and appraise the emotional stresses which contributed to the anti-social conduct of her early life.

I say "contributed" advisedly. For, as Devine[8] points out, "the behaviour of an individual is determined by the prolongation into the present of his past experiences; by his inherited peculiarities; by his physiological state; by the rhythm of his vital processes and the various transformations of the reproductive functions; and by the manifold life situations with which he is confronted." The history and later examination of this woman indicated a variation from the normal, over and above her early temperamental faults. For she stole on the last occasion when temptation was not excessive and the

environmental disharmony was insufficient ordinarily to cause delinquency. This difference is perhaps best described as a constitutional psychic inferiority, limiting the term to those who, through some defect in their mental make-up—usually of volition—are most aptly placed between the temperamental defectives and normal individuals.

Offenders of this clinical type belong to no special age-group and their offences are chiefly of a minor character. They are entirely different from the active, determined criminal whose forcefulness, initiative, and resource outrage society. Many habitual offenders fall into this group, although they may not be recognised during adolescence until efforts at rehabilitation by relations, friends, and after-care associations prove ineffectual. They usually adapt themselves successfully in a penal institution, and are often shrewd, able, and willing workers under supervision, and may intend to reform. But they follow the line of least resistance in the outer world and drift without anchorage. And although they may appreciate their social obligations and possess foresight and discrimination, they are incompetent to deal with situations which demand the suppression of temporary desires—not, seemingly, because the instincts and emotions act with overpowering force, but from passive inadequacy to negotiate life according to social conventions and the law's demands. The will is impotent. The striving for superiority Adler [9] asserts "is an intrinsic necessity of life itself. It lies at the root of all solutions of life's problems, and is manifested in the way in which we meet these problems." It however leaves them unconcerned.

These subjects belong to the subnormal group of inefficients, and the medical witness cannot testify under cross-examination that they are mentally defective. Their failure in life is apparently the result of a limited and not a generalised defect, and the observer cannot demonstrate evidence of mental defectiveness as a result of his own examination. Also, he must remember that "the diagnosis of mental deficiency may be established without a full history from the data observed by the medical examiner, but it can never be firmly sustained, however much it may be suspected, on the evidence of history alone." [10] Moreover, it would seem that the medical witness is unable to testify that the condition is essentially due to an arrest or incomplete development of mind, however strongly he believes it to be due to the failure of a particular mental function. And, still further, he cannot exclude from many cases the influence of a disadvantageous environment or unfavourable upbringing, although he may exclude effects arising from disease or injury before the age of 18.

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2. Maudsley, H.: Responsibility in Mental Disease, London, 1906, p. 66.
3. Report of Royal Commission on Care and Control of Feebleminded, vol. viii., p. 186.
4. Central Association for Mental Welfare Conference on Mental Deficiency, 1930, p. 156.
5. Marshall, R. M.: Jour. Ment. Sci., 1927, lxxiii., 593.
6. Spearman, C.: Psychologies of 1930, Normality, London, 1930, p. 450.
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8. Devine, H.: Recent Advances in Psychiatry. London, 1929, p. 17.
9. Adler, A.: Psychologies of 1930: Individual Psychology, London, p. 398.
10. Report of Mental Deficiency Committee, 1929, Part iii., p. 10.

(*To be continued.*)

A HOSPITAL FOR FUNCTIONAL NERVOUS DISORDER.

THE ancient foundation of St. Luke's Hospital now concentrates its activities mainly on the Woodside Nerve Hospital, which was opened in November last for the reception of cases of functional nervous disorder.[1] The Earl of Athlone, the new president, visited the Woodside Nerve Hospital on June 30th, and was received by the treasurer, Lord Blanesburgh, the committee of governors and such of the honorary consulting staff as were able to be present. Celebrations at the University of Leeds, however, prevented the presence of several of the latter, including Sir John Bland-Sutton, Sir Farquhar Buzzard, Sir John Rose Bradford, Lord Dawson, and Sir Humphry Rolleston.

The hospital stands in some 6¾ acres of ground, overlooking Highgate Woods, and has accommodation for 50 patients, 20 men and 30 women. Most of the rooms in the ward blocks are single bedrooms, and all of them face south, each one opening on to a broad verandah. There are also some private sitting rooms. The treatment block contains rooms for hydrotherapy, colon lavage, massage, light and electrical treatment. There are also in this block dental and X ray rooms, a photographic dark room, a dispensary, and large laboratories equipped for investigation and research. All the capital expenditure in building and equipping has been borne by the St. Luke's Hospital Foundation, but its resources are unequal to the heavy cost of maintaining the new hospital. This must therefore be borne to a great extent by the payment of patients according to their means. At the present time a minimum charge of 5½ guineas a week is made on each bed, two guineas extra being charged for a single room. At the same time every effort is made by means of rebates on these charges, allowed at the discretion of the Committee, to make the resources of the hospital available for those of limited means. The charges are inclusive of all necessary forms of treatment, the only extras charged being for personal laundry, special nurses, and such personal comforts as are not generally included in treatment.

During the six months that the Hospital has been open 65 patients have been admitted, and it is stated that the majority of those discharged have gone out recovered.

[1] See THE LANCET, 1930, ii., 986.

THE CORNER OF GOWER PLACE.

THE new building of Messrs. H. K. Lewis, at the corner of Gower-street and Gower-place, is now complete, and was shown to distinguished visitors at a reception held on July 9th. Sir Gregory Foster, formerly Provost of University College and Vice-Chancellor of the University of London, recalled his student days, when Lewis's consisted of a single house with a total frontage of 25 feet and one shop, about 15 feet by 16 feet, which used to be uncomfortably crowded with students at the beginning of every term. The architectural future of the corner of Gower-street and Gower-place, the site occupied by the new building, had always been an anxiety to the college authorities; now all anxiety had been set at rest by the way in which the rebuilding had been carried out. University College, he said, was fortunate in having at its doors an institution which provided real help in its educational work, and he congratulated "Lewis's" on the high traditions of sound service maintained by their firm.

Prof. H. R. Kenwood gave an address on Textbooks and Education, and Mr. H. L. Jackson, the chairman of Messrs. H. K. Lewis, Ltd., commented on the functions of manufacturers and distributors of books. So long as they sought to make the pathway between the producers and the consumers of books as smooth and as easy and as inexpensive as possible they performed a useful service. A word of praise from Mr. Percy Flemming, F.R.C.S., for the facilities offered by Lewis's circulating library concluded the addresses, and the guests were given an opportunity to inspect the attractive new premises.

PITUITARY CYST.

IN the paper with this title, by Dr. Ranyard West, on p. 69 of our last issue, the first reference should read:—

Worster-Drought, C., Dickson, W. E. Carnegie, and Archer, B. W. C.: Brain, 1927, l., 704.

THE POINTS OF CONTACT IN ELECTRIC SHOCK.

IN a paper published in 1927,[1] R. W. I. Urquhart adduced evidence that when an electric current passed through the brain a block was produced in the respiratory centre; if the heart were not severely damaged, artificial respiration should save the patient by giving the respiratory centre time to recover. Survival has been recorded even after eight hours' artificial respiration.[2] In a later communication[3] Urquhart, with E. C. Noble, showed that a similar block might be produced in the lower part of the spinal cord of a decerebrate cat, and even in peripheral nerves, by an alternating current. Last year O. R. Langworthy and W. B. Kouwenhoven demonstrated[4] that severe electrical currents, when passed through the brain, might cause permanent injury to the cells of the respiratory centres. They now describe experiments[5] on the respiratory damage caused by currents which do not flow directly through the brain.

They used rats, in which the heart is especially resistant to damage by electricity. The results indicate that a current passing through the cervical part of the spinal cord, or through the chest, may cause a suspension of respiration through a temporary block in the vagus nerves; a current passing through the hinder part of the body is much less likely to produce this effect. The authors propose to undertake a histological examination of the central nervous system of all the rats in this series in order to see whether cell change has taken place where the current has not passed through the brain. Of course with the shocks used—1000 volts for two seconds—much damage may be caused by heat alone. The continuous current caused more severe burning, and seemed to cause more cell damage. When passed between the two forelegs both kinds of current killed all the rats and caused much burning and destruction; when the current was passed from a foreleg to a hind leg 41 per cent. survived the alternating current, but all needed artificial respiration; when from a foreleg to the tail only 67 per cent. needed artificial respiration with the alternating and 54 per cent. with the continuous current, and when between the two hind legs none of the rats shocked with alternating current stopped breathing, though 29 per cent. of those shocked with the continuous current required artificial respiration.

It must be remembered, as Langworthy and Kouwenhoven point out, that respiratory block is not the only cause of death—perhaps not even the chief cause—from electric shock in man. In many cases, particularly of shock from low voltages, the cause is believed to be ventricular fibrillation. They quote the experiments of D. R. Hooker,[6] who succeeded in arresting ventricular fibrillation with injections of potassium chloride solution.

[1] Jour. Indust. Hyg., 1927, ix., 140.
[2] Ibid., 1930, xii., 291.
[3] Ibid., 1929, xi., 154.
[4] Ibid., 1930, xii., 31; see THE LANCET, 1930, i., 1218.
[5] Jour. Indust. Hyg., 1931, xiii., 145.
[6] Amer. Jour. Physiol., 1929-30, xci., 305.

TRELOAR CRIPPLES' HOSPITAL, ALTON.—The National Sunday League has presented to this hospital a ward in the new Connaught block in memory of the late Mr. Henry Mills. A ward has also been presented by the Chine Helpers of Southampton.

A NEW CLINIC FOR RHEUMATISM.—The London General Omnibus Company's Employees' Friendly Society has set up a clinic for the treatment of rheumatism, together with dental surgeries, at 61, South Side, Clapham Common, S.W. The house has been adopted and equipped at a cost of over £7000, and the clinic, which was opened by the Minister of Health on July 3rd, is being administered in close association with Manor House Hospital, Golders Green, under the direction of Sir Ambrose Woodall, the senior surgeon.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, July 20th, to SATURDAY, July 25th.—MILLER GENERAL HOSPITAL, Greenwich-road, S.E. Intensive Course in general medicine and surgery. Two weeks, daily 10.30 A.M., to 5.30 P.M., demonstrations, lectures, operations. For either week.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, July 20th.—10 A.M., Gynæcological Ward Visit. Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit, Medical, Surgical, Eye, Gynæcological Out-patients.
TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat, Out-patients, Operations, Medical Ward Visit.
WEDNESDAY.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. Gynæcological Operations. 4.45 P.M., Venereal Diseases.
THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients. Genito-Urinary Department. Operations.
FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.
SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.
SUNDAY, July 19th.—10.45 A.M., Mr. H. E. Batten: Various Forms of Club Foot. 11.45 A.M., Mr. J. Bright Bannister: Some Common Disorders of the Menopause.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, July 23rd.—4.30 P.M., Mr. E. T. C. Milligan: The Injection Treatment of Piles.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, July 21st.—3.30 P.M. (at the General Hospital), Dr. H. Featherstone: Basal Anæsthesia.
FRIDAY (at the Children's Hospital).—3.30 P.M., Dr. B. C. Tate: Eczema in Infants and Children.

Appointments

BAIRD, D. I., M.B., Ch.B. Edin., D.P.H., has been appointed Asst. Medical Officer of Health, Blackburn.
BLISS, T. P., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for Mauchline, Ayr.
LEARMONTH, A. G., M.B., Ch.B. Edin., Asst. Medical Officer, Stirling.

Births, Marriages, and Deaths

BIRTHS.

ATKIN.—On July 7th, the wife of Dr. C. S. Atkin, The Glen, Sheffield, of a daughter.
GIBBERD.—On July 7th, at Welbeck-street, W., the wife of G. F. Gibberd, M.S., F.R.C.S., of a son.
SMITH.—On July 6th, at Cullingworth, Broadstairs, the wife of R. Wylie Smith, M.B., B.Chir., of a daughter.
WORSELDINE.—On July 10th, at Stonefield, Blackheath, the wife of Stanley C. H. Worseldine, Captain I.M.S., of a son.

MARRIAGES.

FAULKNER—WARDE.—On July 9th, at Plymouth, Odin T. Faulkner, C.M.G., Director of Agriculture, Nigeria, to Mildred Warde, M.S., F.R.C.S.
WALKER—DIPLOCK.—On July 11th, at the Parish Church, Croydon, Geoffrey Secker Walker, M.A., M.B., B.Ch. Oxf., Reading-road, Farnborough, Hants, to Joan, only daughter of Mrs. Diplock, of Barclay-road, Croydon, and of the late Mr. Hubert Diplock.

DEATHS.

ANDERSON.—On July 2nd, at a Manchester nursing home, George Reinhardt Anderson, M.B.E., J.P., F.R.C.S., of 45, Westbourne-road, Birkdale, Southport, aged 67.
CROSS.—On July 12th, at Worcester House, Clifton, Bristol, Francis Richardson Cross, F.R.C.S., J.P., LL.D., following an attack of influenza, aged 83.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.